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The Texas Public Health Nursing Work Environment and Outcomes of Job Satisfaction, Organizational Commitment, and Intent to Stay

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Dedication

I dedicate this dissertation to my husband Dale. I could not have completed this work without his love, encouragement, strength and support.

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The Texas Public Health Nursing Work Environment and Outcomes of Job Satisfaction, Organizational Commitment, and Intent to Stay

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This study was conducted to explore the relationships between the work environment, job satisfaction, organizational commitment, and intent to stay from the perspective of public health nurses (PHNs) in Texas. Survey instruments were adapted for use in the population-based public health setting. A cross-sectional prospective survey design was used to conduct this research. The following work environment characteristics were rated favorably by PHNs: manager support, autonomy, teamwork, and an organizational focus on service excellence. However, unfavorable perceptions were reported with regard to new employee orientation and training, opportunities for career growth, staffing adequacy, and a practice model that involved PHNs' input into organizational matters. Most PHNs were committed to their public health agencies and satisfied with their jobs. However, work stresses were experienced. The work environment, job satisfaction, and organizational commitment predicted PHNs' intent to stay. Furthermore satisfaction-to-commitment serial mediation was found in the causal relationship between the work environment and intent to stay. This study fills an important research gap regarding the PHN work environment and outcomes in Texas. Findings will be presented to public health agency leaders and policy makers. The ultimate goal is to provide information and tools that can be used to improve work environment quality and assist public health agencies in the future recruitment and retention of PHNs.

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CHAPTER 1: INTRODUCTION

Regardless of the work setting, healthcare organizations exert a significant influence on nurses' ability to do their jobs. The nursing work environment refers to a collection of internal organizational characteristics designed to maintain a qualified workforce and provide guidance regarding the work performed (Aiken & Patrician, 2000; Kramer & Schmalenberg, 2004a; Lake, 2002; McClure & Hinshaw, 2002; McClure, Poulin, Sovie, & Wandelt, 1983; Stamps, 1997). A significant body of research, largely hospital-based, has shown that organizational characteristics of the nursing work environment are critical to both health care service delivery and nursing work environment outcomes (Aiken & Patrician, 2000; Bloom, Alexander, & Nuchols; 1992; Coomber & Barriball, 2007; Kramer & Schmalenberg, 2004a; Lake, 2002; McClure et al., 1983; Stamps, 1997).

The nursing work environment was first described in a study commissioned by the American Academy of Nursing in the 1980s to identify characteristics of so-called magnet hospitals that were highly successful in hiring and retaining well qualified nurses during a time of nursing shortage. That study found that magnet hospitals were distinguished by the quality of their managers, the respect, autonomy, and opportunities for professional growth afforded to nurses, and the systems in place to support the day-to-day work performed. Researchers concluded that the concept of shared power was a pervasive theme underlying the work environments of magnet hospitals (McClure et al., 1983).

During the 30 years since the original magnet hospital study was conducted, research has focused on further refining key characteristics of the nursing work environment. The following characteristics have emerged as being applicable to nurses

working in any healthcare setting: manager support, professional growth opportunities, adequate staffing, autonomous practice, teamwork, service excellence, and the use of a participatory professional practice model (Aiken & Patrician, 2000; Kramer & Schmalenberg, 2004a; Lake, 2002; McClure & Hinshaw, 2002; McClure et al., 1983; Stamps, 1997). Collectively, these characteristics were shown to affect a number of critical nursing work environment outcomes, including job satisfaction, organizational commitment, and intent to stay or leave (Blegen, 1993; Coomber & Barriball, 2007; Gregory, Way, LeFort, Barrett, & Parfrey, 2007; Jourdain & Chenevert, 2010; Leiter & Laschinger, 2006; Leveck & Jones, 1996; Simpson, 2009a, 2009b; Upenieks, 2003; Wagner, 2007). Ultimately, these nursing outcomes were shown to affect nursing job vacancy and turnover rates (Hayes et al., 2006; Leveck & Jones, 1996).

Within the past two decades, healthcare outcomes have received major attention at the national level (Institute of Medicine [IOM], 1999, 2003a). Nurses play a major role in assuring the highest quality healthcare through ongoing surveillance, strategic intervention, and the prevention of errors. Supportive nursing work environments are essential to the provision of high quality care (IOM, 2003a).

In the United States, public health nursing is considered a specialized area of nursing, with a well-defined scope and standards of practice (American Nurses Association [ANA], 2013). This practice is population-based and largely is performed by nurses working in governmental public health agencies at the national, state, or local level (ANA, 2013; Gebbie, Merrill, & Tilson, 2002). Public health nurses (PHNs) work with individuals, families, communities, and health systems to promote health and address critical public health threats (ANA, 2013; Association of State and Territorial Directors of Nursing [ASTDN], 2007; Quad Council of Nursing Organizations [Quad Council], 2011).

In recent years, PHNs have assumed expanded roles in efforts aimed at environmental health risk reduction and the coordination of public health emergency preparedness and response (ASTDN, 2007). When educationally prepared with a Bachelor of Science or higher degree in Nursing (BSN), PHNs enter the public health workforce with a basic foundation in both nursing and public health science (ANA, 2013; Quad Council, 2011). They possess entry level skills required to perform all essential public health services (ASTDN, 2000; Keller, Strohschein, Lia-Hoadberg, & Schaffer, 2004).

Currently, little is known about the numbers of PHNs employed in the United States. Public health workforce enumeration studies have been conducted rarely, with the most comprehensive data collected more than a decade ago. At that time, approximately 50,000 nurses were employed in public health agencies and PHNs represented the largest professional group in the public health workforce (Gebbie et al., 2002). However, a global nursing shortage recently posed a serious challenge to nursing recruitment and retention in all healthcare settings (Aiken, 2007; Buerhaus, Auerbach, & Staiger, 2007; Buerhaus, 2010; Health Resources Service Administration [HRSA], 2005; Quad Council, 2007; World Health Organization, 2007). Findings from a multi-state workforce case study indicated that the nursing shortage had a profound effect on the ability of public health agencies to recruit PHNs (HRSA, 2005). Furthermore, despite a recent surge in the supply of nurses in the U.S., problems with recruitment and retention persist in the public health setting (Auerbach, Buerhaus, & Staiger, 2014; Department of State Health Services [DSHS], 2013a; University of Michigan Center of Excellence in Public Health Workforce Studies [University of Michigan], 2013).

Work environment research is a tool that public health agency leaders can use to enhance the recruitment and retention of well qualified PHNs. However, over the past

decade, only a limited number of PHN studies of this nature were reported in the research literature. Work environment outcomes seldom were reported (Dingley & Yoder, 2013; University of Michigan, 2013). Only two recent U.S. studies described the psychometric testing of survey instruments used to conduct work environment research in the PHN population. In each of these studies, concerns regarding subscale structure and/or reliability were reported (Campbell, Weber, & Fowles, 2004; Cole, Ouzts, & Stepans, 2010). Therefore, valid and reliable survey instruments are required to fully explore matters related to nursing recruitment and retention in the public health setting.

A national public health agency accreditation process recently was established within the U.S. (Beitsch, Mays, Corso, Chang, & Brewer, 2007; Bender, 2007). Accreditation standards and measures are designed around the infrastructure and activities required to provide essential public health services (Public Health Accreditation Board [PHAB], 2013). A thorough analysis of the work environment has been established as a requirement for accreditation (PHAB, 2013). Work environment surveys provide an opportunity to obtain employees' perspectives regarding a variety of factors affecting service delivery and the ability to recruit and retain a well-qualified workforce (Aiken & Patrician, 2000; Kramer & Schmalenberg, 2004a; Lake, 2002; McClure & Hinshaw, 2002; McClure et al., 1983). Valid and reliable survey instruments would provide an opportunity for benchmarking progress across public health agencies and within the same agency over time.

Purpose

The purpose of this study was to examine the relationships between the PHN work environment and three critical work environment outcomes: organizational commitment;

job satisfaction; and intent to stay. Psychometric properties of the survey instruments were examined. Additionally, demographic characteristics of Texas PHNs were examined. A cross-sectional survey was conducted with PHNs working at the state, regional, and local levels in Texas. Findings will be presented to public health leaders and policy makers across the state.

BACKGROUND AND SIGNIFICANCE

In 2014, Texas was ranked as 31st among the 50 states with respect to the overall health of its population. Public health issues contributing to this low ranking include: a high prevalence of obesity (30.9% of the adult population), a high incidence of Chlamydia infection (494.8 cases per 100,000), a high percentage of infants with low birth weight (8.3% of live births), and a high rate of cardiovascular deaths (255.3 per 100,000 population). Texas ranks especially low with respect to a number of health disparities, including a high percentage of children in poverty (24.5%) and a high percentage of residents without health insurance (22.3%) (United Health Foundation [UHF], 2014). Infectious disease threats and other natural and manmade disasters also pose additional public health risks (DSHS, 2014a). Numerous examples of interventions to address such issues have been reported in the PHN research literature (Keller, Strohschein, Schaffer, & Lia-Hoagberg, 2004).

Only limited information is available concerning the capacity of the PHN workforce to address these critical public health issues at the state and local levels in Texas. In 2008, it was estimated that 500 Registered Nurses (RNs) and 320 Licensed Vocational Nurses (LVNs) worked for 64 local health departments throughout the state (DSHS, 2008a, 2008b). Approximately 250 RNs worked for the state public health agency at that time (DSHS, 2009). In 2012, a survey was conducted to update these public health nursing

workforce data. Approximately 78% of public health agencies in Texas responded, with a total of 892 nurses reported to be employed.

The limited data regarding practicing PHNs in Texas raise three immediate concerns. First, although workforce capacity cannot be measured accurately using currently available data, it seems evident that Texas lacks an adequate supply of PHNs. The Association of State and Territorial Directors of Nursing (ASTDN) recommended a ratio of 1 PHN per 5,000 population to address critical issues affecting the public's health (ASTDN, 2007). According to the ASTDN, examples of strategic PHN services required at this staffing level include emergency preparedness and response, immunization clinics, targeted case management, health teaching and promotion, disease outbreak investigation, community health planning/organizing, and health advocacy (ASTDN, 2007). Given that more than 26 million people currently live in Texas, PHN numbers clearly fall far below nationally recommended staffing levels (ASTDN, 2007; United States Census Bureau, 2012). It is estimated that approximately four times the currently documented number of PHNs would be required to adequately address public health service needs.

Second, detailed demographic characteristics currently are not available regarding the educational preparation and job roles of nurses working for public health agencies in Texas. Therefore, it would be important to know to what extent PHNs are educationally prepared with a Bachelor of Science (BSN) or higher degree in nursing. Without this minimum educational preparation, public health agencies may be limited in their capacity to offer population-focused public health services (ANA, 2013).

Finally, given the documented low numbers of PHNs in Texas and potential concerns regarding educational preparation, it is critical that the work environment be conducive to hiring and retaining well qualified PHNs. Recently published PHN vacancy

rates varied greatly by geographic region, with the highest number of vacancies found in metropolitan areas and in border areas of the state (DSHS, 2013a). This suggests that factors that are external to the public health agency may also play a part in the success of public health agencies in recruiting and retaining qualified PHNs.

STATEMENT OF THE PROBLEM

The successful recruitment of well qualified PHNs is vital to the public's health. Clearly, poor state-wide health rankings imply a critical need for PHNs to develop services to address critical public health problems in Texas. However, recent studies provided evidence that PHN capacity is lacking at both the state and national levels. Furthermore, as many as one-third of currently employed PHNs lack the educational preparation to provide the level of population-based public health services required. Limited data are available regarding the public health work environment or its influence over PHNs' job satisfaction, organizational commitment, or intent to stay with their employers. As magnet hospital studies have shown, it is important to collect, analyze, and act on such data to ensure the successful recruitment and retention of well-qualified nurses. In combination, these factors suggested a critical need for comprehensive PHN work environment research.

This study will fill a gap in knowledge regarding the PHN work environment and nursing work environment outcomes in Texas. Data were collected at local, regional, and state public health agency levels. Findings are intended for use by public health leaders and policy makers in developing optimal strategies for the recruitment and retention of Texas PHNs.

RESEARCH QUESTIONS

Four research questions were answered through this study of PHNs in Texas:

1. What are the psychometric properties of the Public Health Magnetic Resource Inventory (PH-MRI), the Magnetic Resource Inventory Organizational Commitment Scale (MRI-OC), Hoppock's Job Satisfaction Scale (HJSS), and the Public Health Intent-to-Stay Scale (PH-ITS) as survey instruments used with this PHN sample?
2. How do PHNs perceive characteristics of their work environment?
3. How do PHNs perceive their organizational commitment, job satisfaction, and intent to stay?
4. How do perceptions of the work environment, organizational commitment, and job satisfaction predict PHNs' intent to stay?

Theoretical Framework

The Structure-Process-Outcome (SPO) model for healthcare service quality served as the grand theory for this study of PHNs in Texas. According to Donabedian (2003), the SPO model provides a framework for monitoring and continuously improving healthcare quality. *Structure* relates to relatively stable properties of the healthcare organization, including such things as facilities, material resources, human resources capacity, hierarchical reporting structure, and the nature of services rendered. *Process* refers to the provision of healthcare services as well as the underlying operations that enable services to be delivered. *Outcomes* represent a change in patient or workforce status as a result of work environment processes. Furthermore, structure must be adequate to ensure that appropriate processes can be developed. Processes must be monitored to ensure that they remain efficient and effective. Only then can desired outcomes be achieved.

Based on the research literature and subject matter expert opinion, a middle range theory was developed to guide this study of the PHN work environment, job satisfaction, organizational commitment, and intent to stay in Texas. The variables to be measured were chosen based on a review of the public health research literature and consultation with public health and nursing work environment subject matter experts. Survey instruments were developed or adapted to the public health setting and used to serve as empirical measures of the study variables.

STRUCTURAL CHARACTERISTICS

At the level of middle range theory, *structure* was viewed as relatively stable characteristics of a public health agency and its nursing workforce. Based on consultation with public health subject matter experts, agency characteristics were determined to include such things as agency type, work setting, voluntary accreditation status, and presence or absence of a chief nursing officer. Workforce characteristics included PHN license-types, job roles, job functions, and selected personal attributes (e.g., age, race/ethnicity, gender, highest education, work experience, etc.). A demographic data sheet was developed to capture structural characteristics of public health agency employers and PHN survey participants.

PROCESS CHARACTERISTICS

At the level of middle range theory, *process* was deemed to represent public health agency work environment processes that were most critical to PHN practice. Based on the nursing and public health research literature, the following were considered to serve as critical work environment process characteristics: management support, opportunities for professional growth, autonomy, adequate staffing, teamwork, use of a participatory

practice model, and fostering service excellence (Dingley & Yoder, 2013; Kramer & Schmalenberg, 2002, 2004a; Lake, 2002). The Public Health Magnetic Resource Inventory (PH-MRI) survey instrument was used to evaluate critical PHN work environment processes. This instrument was adapted from a survey tool designed for use in performing nursing work environment research in multiple healthcare settings (W. Jones, personal communication, July 22, 2010).

WORK ENVIRONMENT OUTCOMES

At the level of middle range theory, *outcome* was deemed to refer to PHNs' perceptions regarding three critical public health work environment outcomes: job satisfaction, organizational commitment, and intent-to-stay. Intent to stay was considered the ultimate outcome of interest. Furthermore, job satisfaction and organizational commitment were believed to separately mediate the relationship between the work environment and intent to stay.

Job Satisfaction

Numerous studies showed positive and statistically significant relationships between nursing work environment characteristics and the level of job satisfaction experienced (Blegen, 1993; Hayes et al., 2006; Irvine & Evans, 1995; Kelly, McHugh, & Aiken, 2011; Price & Mueller, 1981, 1986a; Schmalenberg & Kramer, 2008a; Zangaro & Soeken, 2007). Furthermore, studies in the healthcare and business literature showed that job satisfaction mediates the causal relationship between the work environment and an employee's intent to stay (Curry, Wakefield, Price, & Mueller, 1986; Price & Mueller, 1981, 1986a; Tett & Meyer, 1993). Therefore, for the middle range theory developed for

this PHN study, job satisfaction was considered to serve as a mediator between the work environment and intent to stay.

Hoppock (1935) found that job satisfaction could be determined by asking employees to describe how much of the time they felt satisfied with their jobs, how well they liked their jobs, whether or not they considered changing jobs, and how they felt they compared to others with regard to the level of job satisfaction experienced. These questions were incorporated into Hoppock's Job Satisfaction Scale (HJSS). The HJSS was selected to serve as an empirical measure of global job satisfaction in this study of PHNs.

Organizational Commitment

Studies in the nursing and hospital research literature showed a statistically significant and positive relationship between the work environment and organizational commitment (Chu, Lee, & Hsu, 2006; Ingersoll, Olsan, Drew-Cates, DeVinney, & Davies, 2002; Price & Mueller, 1986a). Moreover, organizational commitment was found to mediate the relationship between the work environment and intent to stay (Curry et al., 1986; Price & Mueller, 1981, 1986a; Tett & Meyer, 1993). Therefore, for the middle range theory developed for this PHN study, organizational commitment also was considered to serve as a mediator between the work environment and intent to stay.

In a qualitative study conducted by the Mississippi Office of Nursing Workforce, nurses and healthcare administrators (n = 170) described organizational commitment as having two components: commitment and concerns. Commitment was described as the employees' emotional attachment to the healthcare organization, which made them willing to work hard to achieve the organization's mission and goals. Conversely, commitment-related concerns were thought to include such things as stress and burnout, which could adversely affect nurses' commitment to the healthcare organization, as well as their

performance of the job. The Magnetic Resource Inventory Organizational Commitment Scale (MRI-OC) was developed to measure organizational commitment and commitment-related concerns (W. Jones, personal communication, July 22, 2010). Therefore, it was chosen to serve as an empirical measure of organizational commitment in this study of PHNs.

Intent to Stay

At the level of middle range theory, intent to stay was viewed as the ultimate self-reported work environment outcome. It represents an employee's perceptions regarding the viability of a continued career within the organization (Ingersoll et al., 2002). In addition, it has been shown to serve as an excellent proxy measure for actual employee turnover (Griffeth, Hom, & Gaertner, 2000; Price & Mueller, 1981, 1986a). The Public Health Intent to Stay (PH-ITS) scale was adapted from instruments developed by Price and Kim (1993) and Ingersoll et al. (2002). The PH-ITS scale served as an empirical measure of intent to stay for this PHN study.

CONCEPTUAL MODEL

Figure 1 provides a visual depiction of the theoretical framework for this PHN study. The SPO grand theory is located at the top of the model (Donabedian, 2003). Immediately below this level is the middle range theory developed to describe specific concepts related to public health agency structure, work environment processes, and work environment outcomes. At the bottom of the model, concepts defined through middle range theory are linked to specific instruments used to collect empirical data for this PHN study in Texas (See page 13).

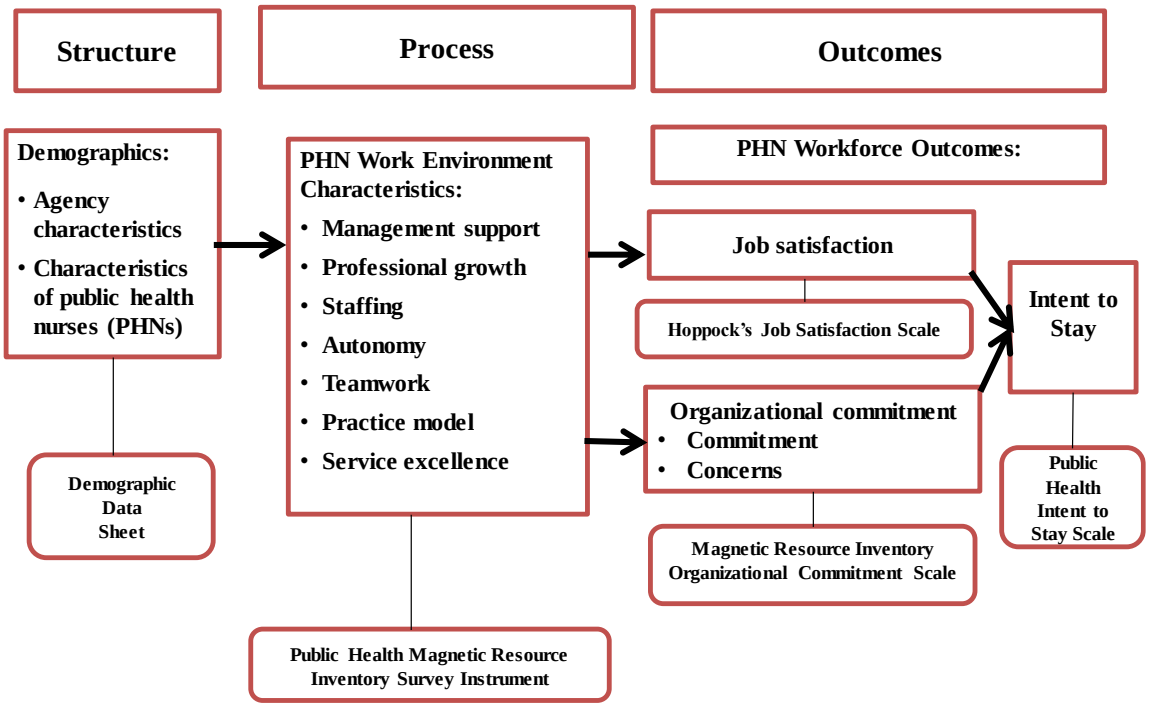

Figure 1: Conceptual Model

DEFINITION OF TERMS

The following operational definitions provide clarification of major terms used in this research study:

Autonomy refers to an employee's ability to initiate and regulate actions within the work environment (Spreitzer, 1995). For this study, autonomy was measured using the Public Health Magnetic Resource Inventory (PH-MRI) work environment survey instrument.

Commitment refers to an employees' emotional attachment, which results in in their willingness to work hard to achieve the organization's mission and goals (Allen & Meyer,

1990). Commitment was measured using the Magnetic Resource Inventory-Organizational Commitment (MRI-OC) scale.

Concerns refer to such things as stress and burnout that could adversely affect commitment to the organization and performance on the job (Maslach & Jackson, 1981). Concerns were measured using the MRI-OC scale.

Demographics refers to attributes of the public health agency and characteristics of PHNs in the study sample such as gender, age, education, job role, years of service, etc. that could potentially influence perceptions of the work environment and related work environment outcomes. Demographic information was collected using a data sheet designed for this study.

Intent to stay refers to an employee's perception of the likelihood of remaining employed with an organization (Price & Mueller, 1981). Intent to stay was measured using the Public Health Intent to Stay Scale (PH-ITS), which was designed for this study based on models by Price and Kim (1993) and Ingersoll et al. (2002).

Job satisfaction refers to the extent to which employees like their jobs (Hoppock, 1935; Price & Mueller, 1986a; Spector, 1985). For this study, job satisfaction was measured using Hoppock's Job Satisfaction Scale (HJSS).

Management support refers to the encouragement, assistance, direction, and leadership provided to employees by managers throughout the chain-of-command, but especially by the employee's direct manager or supervisor (McClure et al., 1983). For this study, management support was measured using the PH-MRI survey instrument.

Organizational commitment refers to the extent to which employees feel a sense of loyalty toward the organization and are willing to work hard to achieve its goals (Allen &

Meyer, 1990; Maslach & Johnson, 1981; Porter, Steers, Mowday, & Boulian, 1974). For this study, organizational commitment was measured using the MRI-OC scale.

Professional growth refers to organizational support for educational and professional development throughout an employee's career (McClure et al., 1983). For this study, professional growth was measured as a work environment process using the PH-MRI survey instrument.

Practice model refers to an organization-wide system whereby nurses participate in decisions regarding their professional practice and have input into organizational matters that are practice-related (Kramer & Schmalenberg, 2003; Kramer et al., 2008; Kramer et al., 2009). For this study, the practice model was measured using the PH-MRI survey instrument.

Service Excellence refers to an organization-wide commitment to ensuring and improving the quality of services delivered (Donabedian, 2003). For this study, service excellence was measured using the PH-MRI survey instrument.

Staffing refers to a sufficient number and mix of personnel to perform the work required (Kramer & Schmalenberg, 2005; McClure et al., 1983). For this study, staffing was measured using the PH-MRI survey instrument.

Teamwork represents efforts of a group to coordinate work to accomplish goals while recognizing the importance of multiple perspectives (Krueger et al., 2002). For this study, teamwork was measured using the PH-MRI survey instrument.

Assumptions

The following assumptions are made for this study:

1. Quality public health services are dependent on adequate numbers of well-qualified nurses in the work environment.
2. Most PHNs eligible to participate in this survey had access to computers and were sufficiently technologically savvy to complete the survey online.
3. The PHNs participating in this study were honest and thorough when completing the survey.
4. Results of the survey accurately reflected the demographic characteristics of PHNs in Texas.
5. Results accurately reflected PHNs' perceptions regarding the work environment and related work environment outcomes.

Limitations

This study was conducted to provide an overview of the public health work environment and work environment outcomes in Texas from the perspective of PHNs. Therefore, findings were not directly attributed to individual agencies participating in the study or the nurses they employ. However, work environment research could be highly beneficial to public health agencies at the individual organizational level. Research of this nature is routinely conducted by hospitals known for the quality of their work environments (Upenieks, & Sitterding, 2008).

Chapter Summary

Health rankings in Texas are among the poorest of any state in the nation. Weather related events and other public health disasters represent additional ongoing risks. Public health nurses play an important role in addressing these critical public health challenges. However, there is limited research regarding the capacity of PHNs to address these needs. Hospital-based research has shown that the nursing work environment plays a vital role in the successful recruitment and retention of nurses. This study fills an important research gap regarding the PHN work environment in Texas. Work environment findings will be presented to public health agency leaders and Texas policy makers in order to assist them in identifying optimal strategies for the recruitment and retention of PHNs.

CHAPTER 2: LITERATURE REVIEW

This chapter serves as a review the research literature with regard to the nursing work environment and critical work environment outcomes. The chapter begins with an overview of landmark studies designed to identify critical process characteristics of the nursing work environment. Next, an in-depth review of the literature is provided for seven work environment characteristics that are deemed critical to the work of public health nurses (PHNs) perform: management support, professional growth, staffing adequacy, job autonomy, teamwork, service excellence, and control over nursing practice. Finally, an in-depth review is conducted for the following critical work environment outcomes: organizational commitment, job satisfaction, and intent-to-stay. Each of the work environment process characteristics and work environment outcomes reviewed in this chapter were incorporated into middle range theory and empirical measures used for this study of the PHN work environment and work environment outcomes in Texas.

Nursing Work Environment Research

A national nursing study commissioned by the American Academy of Nurses in the early 1980s is considered the first to identify organizational characteristics essential to a high quality nursing work environment within the hospital setting. Hospitals in the U.S. were nominated to participate in that study based on their success in recruiting and retaining well qualified nurses and their reputation as an excellent place to work. Interviews were conducted with nursing leaders and nursing staff from 41so-called "magnet" hospitals in eight regions throughout the U.S. (McClure et al., 1983). In that landmark study, shared power was found to be an underlying theme that distinguished magnet hospitals from others (McClure et al., 1983). The emphasis on shared power was

found to be manifested through what has subsequently been described as the following 14 Forces of Magnetism: strong nursing leadership, decentralized decision-making, participatory management style, supportive personnel policies, professional practice models, high quality patient care, organizational emphasis on quality improvement, availability of consultation and resources, nursing autonomy, a broad community focus, a teaching emphasis, a professional nursing image, opportunities for professional growth, and interdisciplinary teamwork and collaboration. The 14 Forces of Magnetism were adopted by the American Nurses Credentialing Center in 1994 to serve as criteria for awarding official Magnet designation to health care organizations that met the highest standards of excellence (American Nurses Credentialing Center [ANCC], 2008; Thomas & Herrin, 2008).

In 2000 and 2001, a qualitative study was conducted with 279 staff nurses who worked in 14 magnet hospitals to identify work environment characteristics that represented the Essentials of Magnetism. Ultimately, eight overarching characteristics were selected by approximately two-thirds of participants. These characteristics were: a clinically competent nursing staff, support for training and education, autonomous nursing practice, supportive supervisors and managers, control over nursing practice, good working relationships between RNs and MDs, adequate staffing levels, and a patient-centered organizational focus (Kramer & Schmalenberg, 2002). In subsequent research, Kramer and Schmalenberg adopted Donabedian's structure-process-outcome (SPO) grand theory as an overarching conceptual framework for evaluating work environment quality. Within this framework, Kanter's empowerment theory and a newly developed theory of autonomy served as a guide for evaluating power in relationships, as well as the degree of individual and collective nurse-directed action (Kramer & Schmalenberg, 2004a).

Flynn (2003) surveyed a random sample of 700 home health nurses in the U.S. selected from two national nursing mailing lists. A total of 403 respondents returned completed surveys for a response rate of 61%. Participants were asked to list home health agency characteristics that were most important to their nursing practice. The 10 work environment characteristics most frequently identified were: support for education, supportive managers, focus on quality of care, supportive administration, good communication, flexible schedules, competitive pay and benefits, adequate staffing, manageable workloads, and nursing input into decision-making.

In 2010, a nation-wide qualitative study was conducted in Canada to identify strategies to build public health service capacity and foster the recruitment and retention of PHNs. Focus groups comprised of frontline PHNs, policymakers, and managers were conducted at 23 sites across the nation. Based on a thematic analysis of focus group discussions, the following were deemed to be essential to optimal PHN practice: program planning, communication, staffing adequacy, opportunities for professional growth, overall support of PHN practice, public health partnerships, and healthy workplace policies. However, the report lacked detail regarding specific organizational characteristics required to support PHN practice (Meagher-Stewart et al., 2010).

In 2012, a public health nursing work environment study was conducted by the University of Michigan's Center of Excellence in Public Health Workforce Studies. The study was conducted in two phases. Public health agencies were surveyed first, with participation by state health departments in all 50 states and the District of Columbia, as well as a stratified sample of local health departments across the US. An individual survey was conducted next, with surveys sent to PHNs working for participating health

departments. Of the 7,500 individual PHN surveys sent, 2,700 completed surveys were returned (response rate = 35%).

This nation-wide PHN work environment study revealed a number of important findings. First, opportunities for public health education and training needed to be strengthened. This issue was considered especially important for those PHNs who lacked educational preparation with a baccalaureate or higher degree in nursing. Next, PHN recruitment was considered a significant problem. In many cases, salaries were not considered to be competitive with other healthcare settings. Furthermore, opportunities for career advancement were perceived to be lacking. However, despite these deficiencies, employed PHNs generally reported high levels of job satisfaction (University of Michigan, 2013).

A recent survey was conducted with PHNs and other staff (n = 10,246, response rate = 46%) working in state public health agencies throughout the U.S. This study primarily focused on employees' training needs. However, several aspects of the work environment also were assessed. Most respondents reported that they were treated with respect (82%) and had a good working relationship with their managers (84%). They were encouraged to demonstrate leadership skills (66%) and were supported in other aspects of employee development (70%) (Harper, Castrucci, Bharthapudi, & Sellers, 2015).

WORK ENVIRONMENT CHARACTERISTICS

Management Support

In a recent nation-wide qualitative study in Canada strong leadership and management skills were found to be critical to the optimal use of PHNs. Effective leadership was considered necessary for establishing trust and respect, promoting a

diversity of PHN roles, and facilitating positive changes over time. Good management was considered vital to supporting PHNs' efforts to achieve the agency's goals (Meagher-Stewart et al., 2010).

Bass and colleagues (2003) describe leadership as a constellation of qualities that inspire subordinates to follow their managers (Bass, Jung, Avolio, & Berson, 2003). In an early qualitative study of magnet hospital nurses in the U.S., McClure et al. (1983) found that strong leadership was exhibited by highly qualified managers who: served as role models, inspired change, and demonstrated a willingness to take risks. In addition, good leaders were found to: communicate well, actively listen to nurses' concerns, promote interdisciplinary collaboration, and provide needed resources and support. In a large mixed-method study of hospital staff nurses in the U.S. (n = 4,421), Kramer and Schmalenberg (2004b) further described the following as strong leadership qualities of managers: supporting autonomous decision-making by staff, empowering staff to form collegial interdisciplinary relationships, instilling organizational values, providing needed resources, and facilitating teamwork.

Empowerment often is described as a critical leadership quality. Managers empower employees by sharing decision-making authority and responsibility with those individuals who are closest to the problem and best suited to take effective action (Kanter, 1977, 1983, 1993). In a 5-year case study of multiple large industrial and service-oriented corporations in the U.S. and abroad (n = 37), Kanter (1983) analyzed empowerment and its effects on problem-solving and innovation. Data were collected through key informant interviews, observations, analysis of corporate documents, and a series of employee surveys. Based on thematic analysis of the data, Kanter found that managers were most effective in leading change by ensuring employees were well-trained and had access to

information, resources, and support needed to take action. Information included the data, technical knowledge, and expertise required to analyze problems and identify possible solutions. Resources included funding, facilities, materials, and dedicated work time. Support involved negotiation with others throughout the organization to ensure legitimacy, endorsement, approval, and diffusion of employee innovations (Kanter, 1983).

Positive and negative experiences related to employee empowerment were described in three PHN studies conducted within the past decade. In the first of these studies, Campbell and colleagues (2004) evaluated the statistical relationship between the decisional involvement and job satisfaction of PHNs in one U.S. Midwestern state (n = 192, response rate = 55%). Job satisfaction was found to be positively associated with the vertical integration of decision-making between staff and managers (r = .66, $p \leq .01$) (Campbell et al., 2004). Conversely, in a second study (n = 316, response rate = 86%), Hsu and colleagues (2006) found that 72% of PHNs in Taiwan lacked confidence in their ability to manage a prolonged Severe Acute Respiratory Syndrome (SARS) outbreak. This problem largely was attributed to a lack of information, resources, and support to mount the level of response required. Confidence was significantly increased when daily updates were received (OR = 2.26, 95% CI) (Hsu, Chen, Chang, & Chang, 2006). Moreover, in a third qualitative study of 941 community/public health nurses in Canada (response rate = 62%), Bergeron and colleagues (2006) described a similar lack of management support with respect to the communication and resources needed to adequately manage SARS (Bergeron, Cameron, & Armstrong-Stassen, 2006).

In a study by Ellinger and colleagues (2008), managerial coaching was described as an empowering leadership behavior. Findings were synthesized from a mixed-methods study conducted in three public sector settings in the U.S. (i.e., a secondary school, a civil

service department, and a public hospital). Data were collected through semi-structured interviews with managers (n = 222) and a cross-sectional survey administered to upper management, front-line managers, and staff nurses (n = 520). The following consistently were described as leadership behaviors exhibited by effective managerial coaches: thinking reflectively or prospectively, sharing knowledge, empowering staff by delegating authority and establishing trust, assessing and supporting employee development needs, providing guidance and counseling, serving as a role model, being caring and considerate, promoting professional advancement, and challenging employees to try new things. Conversely, poor coaching was described as being: too controlling, too task oriented, too intense or emotional, too intimidating, unable to communicate effectively, inconsiderate or inappropriate, unwilling to take time with staff, not sufficiently assertive, uncaring, or too tolerant of poor employee performance (Ellinger, Hamlin, & Beatie, 2008).

Two recent PHN studies included findings related to managerial coaching. In the first of these studies, community/public health nurses were surveyed in Canada (n = 1,044, response rate 55%). Based on a scale of 1 (strongly disagree) to 5 (strongly agree), PHNs consistently gave positive ratings for the leadership qualities of their managers. Specific behaviors rated were as follows: coaching (M = 3.16, SD = 1.05), feedback (M = 3.28, SD = 1.11), soliciting input (M = 3.64, SD = .96), showing appreciation (M = 3.64, SD = .98), encouraging staff to communicate freely (M = 3.65, SD = 1.06), and delegating authority (M = 3.73, SD = .98) (Armstrong-Stassen & Cameron, 2005). However, in a second study of PHNs in Taiwan (n = 167, response rate = 98%), conflicting job demands, poor communication, and lack of guidance from managers were found to serve as significant sources of job stress. Lack of adequate coaching from managers was mitigated to some degree by years of experience working as a PHN (Lee & Wang, 2002).

Whereas leadership behaviors are motivational in nature, management behaviors are task-oriented and focused on accomplishing work activities to be accomplished on a day-to-day basis. Based on a nation-wide qualitative study of magnet hospital staff nurses, McClure et al. (1983) found that good managers consistently were described as visible, accessible, and comfortable in soliciting staff input regarding day-to-day decisions made at the unit and higher levels. Good managers also were found to be actively involved in oversight of the work staff nurses performed. More recently, Kramer and Schmalenberg (2004b) evaluated nurses' perceptions of day-to-day management practices in a mixed-methods study of hospital staff nurses in the U.S. (n = 4,421). The following practices were considered to be most critical to a well-functioning work environment: providing new staff orientation and ongoing learning opportunities, monitoring work flow, attending to daily staffing and scheduling needs, pitching in to perform services when needed, and overseeing unit activities on an ongoing basis.

In a concept analysis conducted by Batson and Yoder (2012), managerial coaching was described as a facilitating management practice. Face-to-face communication between the employee and manager is required in order to set goals for job performance and professional development. Follow-up sessions must be scheduled with sufficient frequency to ensure ongoing progress and take corrective action as required. Through this process, the primary role of the manager is to provide guidance, feedback, and support. It is essential that new managers receive training regarding the coaching process in order to ensure that they understand how to implement this important career development relationship.

As indicated by the research literature, management support is critical to nursing practice in any healthcare setting. Therefore, any work environment research instrument

should be designed to measure the extent to which employees are engaged by their managers in shared decision-making and are coached. Also, elements of day-to-day supervision, such as employee evaluations, problem correction, and conflict resolution, should be measured. Furthermore, communication, change management, and inspirational leadership are management characteristics that should be assessed. Research of this nature would fill the gaps in current knowledge by providing public health agencies with information about manager development needs and potential strategies for improving the work environment through enhanced management support.

Professional Growth

To perform at an optimal level, employees must have sufficient opportunities for professional growth. In a case study of multiple corporations in the U.S. and abroad, Kanter (1983) found that professional growth was made possible when employees were supported in their efforts to enhance their professional knowledge and skills. The enhanced competency resulting from these efforts should then be rewarded through opportunities for more challenging work and career advancement.

Within the acute care setting, professional growth has been described as a hallmark of magnet hospitals. In the original magnet hospital study published in 1983, hospital employers reported their investment in the professional growth of nurses was considered to be a commitment to the quality of nursing care delivered. Newly hired nurses were enrolled in orientation, preceptor, and mentoring programs. Training was provided and nurses were supported in attending continuing professional education programs in subjects related to their area of practice. Financial and administrative support was provided for nurses who wished to pursue baccalaureate and higher educational degrees. In addition, ample opportunities were provided for both clinical and administrative career growth, with

increased salary and other incentives tied to performance excellence and career advancement (McClure, 1983).

Emphasis on professional growth continues to be a cultural norm in magnet hospitals, which are known for maintaining a high quality work environment. In a recent series of qualitative studies (n = 446), Schmalenberg et al. (2008) found that systems for professional growth identified in the original magnet hospital study in 1983 were retained over the 30 years that followed. One recent addition was access to widely available computer and online continuing education.

Studies showed that PHNs, like their counterparts in acute care settings, place high value on professional growth (Hansen et al., 2007; Meagher-Stewart et al., 2010). However, much of the research to date regarding this issue has strictly focused on PHNs' perceptions regarding professional competency. In the U.S., the Quad Council of Public Health Nursing Organizations (2011) published a list of specific PHN core competencies that were identified through a consensus-building process involving subject matter experts from multiple organizations. Generalist, management, and executive level PHN competencies were categorized under eight domains as follows: analytic assessment, policy development/program planning, communication, cultural competency, community dimensions of practice, public health sciences, financial planning and management, and leadership and systems thinking.

In studies conducted in the U.S. and abroad, PHNs frequently reported feeling competent to perform their jobs. In one U.S. study, PHNs working in staff and management positions (n = 124) were asked to rate their self-perceived competency in each of the eight public health core competency domains. Competency was rated based on Benner's (1982) 5-stage model, ranging from 1 (beginning competence) to 5 (expert).

Overall, staff PHNs rated themselves as being moderately competent (M = 3.28, SD = .60). Higher levels of competency were reported for communication, cultural competency, and leadership. Lower ratings were given for planning and policy development, analytic assessment, and financial planning and management. Baccalaureate-prepared nurses reported feeling more competent in analytic assessment skills than their non-BSN counterparts (t = - 2.63, $p \leq .01$). Nurse managers felt more competent than staff level PHNs in leadership, analytic assessment, basic public health skills, and policy/planning ($p \leq .05$). Overall competency was positively correlated with years of experience in nursing (r = .29, p $\leq$ .001) and years of experience as a PHN (r = .29, $p \leq .001$) (Bigbee, Otterness, & Gehrke, 2010).

Issel et al. (2006) reported findings from a 2-state U.S. study of PHN competency. Their sample included nursing faculty (n = 46, response rate 38%) and public health agency nursing staff (n = 168, response rate = 84%). On a scale of 1 (need to be taught this) to 5 (do and teach this to others), faculty reported feeling most competent in facilitating service linkages (M = 4.10, SD = 1.02) and finding innovative solutions through research (M = 3.99, SD = .92). Staff PHNs only reported competence in facilitating service linkages (M = 3.42, SD = .84). For faculty, years of experience as a PHN enhanced competency in health status monitoring (r = .53, $p \leq .01$), community mobilization (r = .49, $p \leq .01$), informing and educating (r = .43, $p \leq .05$), and health service monitoring (r = .43, $p \leq .01$). For staff PHNs, more years of experience was reported to translate into higher levels of competency for all but the informing and educating domain (Issel, Baldwin, Lyons, & Madamala, 2006).

Guo and colleagues (2008) surveyed PHNs in Taiwan (n = 1,837, response

rate = 67%) to determine their perceived level of competency. Respondents scored high in direct service competencies, but lower in the ability to apply biostatistics, epidemiology, and health promotion principles. Competency was predicted by task frequency, years of experience as a PHN, nurse manager job role, education, and rural work location ($R = .40$, $p \leq .05$). However, task frequency was by far the greatest predictor of competency ($\beta = .59$, $p \leq .001$) (Guo, Hsu, & Lin, 2008).

Education and training were identified as important strategies to build PHN competency and thereby enhance public health service capacity (Meagher-Stewart et al., 2010). However, three recent PHN studies suggest that support for training and education needs to be strengthened. In the first of these studies, Bergeron and colleagues (2006) found that Canadian nurses ($n = 941$, response rate = 62%, PHN subset = 290) lacked sufficient training to rapidly respond to mass disease outbreaks, such as SARS (Bergeron et al, 2006). In a second study, Hill and colleagues found that PHNs in one rural state in the U.S. ($n = 141$, response rate = 62%) required further training to incorporate environmental health competencies into their practice (Hill, Butterfield, & Kuntz, 2010). In the third study, the University of Michigan (2013) ($n = 2,700$, response rate = 35%) found that 64% of PHNs across the US perceived a great need for education and training that is relevant to their practice. This need was considered to be especially acute for those PHNs without a baccalaureate or higher degree in nursing because they lacked a basic educational foundation in public health science.

In 2014, a survey was conducted to determine the training needs of PHNs and other staff working in state public health agencies in the U.S. A total of 10,246 participants responded (response rate = 46%). Most participants (71%) reported that their supervisors supported professional development. They further reported that their agencies provided

internal training, covered travel/registration for external training, and allowed staff to attend training during working hours. However, despite this support, significant gaps were identified between the perceived importance of core public health competencies and the ability to perform them at even an entry level (Sellers et al., 2016).

Two recent PHN studies in the U.S. reported mixed results regarding PHNs' opportunities for career advancement. Campbell et al. (2004) found that PHNs in one state reported overall satisfaction with opportunities for advancement (M = 13.04, SD = 2.63, Range = 5 – 20). However, in the nation-wide study conducted by the University of Michigan (2013), approximately 56% of PHNs reported that opportunities for career advancement were lacking. A majority of state and local health departments concurred with this finding. In addition, these agencies reported that salary incentives were lacking.

Clearly, ongoing research is needed to monitor the extent to which public health agencies invest in the professional growth of their PHNs. As indicated from findings in magnet hospital studies, important areas for organizational assessment would include: employee orientation and training, support for professional continuing education, support for undergraduate and/or graduate education/degree completion, opportunities for career growth, and related financial incentives (McClure et al., 1983; Kramer & Schmalenberg, 2008a; Schmalenberg et al., 2008). Research of this nature would provide public health agencies with critical information about organizational changes made and further changes required.

Staffing

In a 5-year case study of business practices within the U.S., Kanter (1983) found that staffing adequacy was of critical importance to ensuring an effective response to

changing external conditions. Staffing adequacy was defined as having the right number of well-qualified staff and empowering them to be innovative in the face of changing demands. Successful innovation required that employees be given adequate time to devote to problem-solving. Otherwise, increased workload could result in employee burnout and a lack of commitment to meaningful change.

Hospital nurses who participated in the original magnet study reported that their managers continually strived to maintain adequate levels of well-qualified staff. Favorable nurse-to-patient ratios were considered to be important for the provision of safe patient care. Furthermore, adequate staffing levels allowed nurses to spend more time at the bedside. In combination, these conditions were considered to be a source of satisfaction for the nursing staff (McClure, 1983).

In a landmark study of the U.S. healthcare industry, the Institute of Medicine (IOM) stressed the importance of nurse staffing for the delivery of high-quality hospital-based patient care and the assurance of patient safety (IOM, 1999). In a large study conducted with 10,184 staff nurses from 168 hospitals in one state (response rate for nurses = 52%), nurse-to-staff ratios were compared to risk-adjusted findings regarding work environment outcomes. For each additional patient above a recommended nurse-to-patient ratio, there was a 7% likelihood of patient death within 30 days of admission. In addition, there was a 23% increase in the odds of nursing burnout (Aiken, Clarke, Sloane, Sochalski, & Siber, 2002). However, a more recent qualitative study of hospital nurses in the U.S. (n = 279) found that patient safety and health care quality could not be guaranteed by staff numbers alone. Safety and quality also were influenced by such factors as training, education, skill mix, and overall flexibility in the delivery of services (Schmalenberg & Kramer, 2009b).

More recently, the Robert Wood Johnson Foundation and the IOM conducted an extensive evaluation of the nursing profession in the U.S. to identify strategies for enhancing workforce capacity. In a report of findings, the following strategies were recommended: ensure that nurses practice to the full extent of their education and training, provide nurses with access to higher levels of education and training, engage nurses as full partners in workforce and healthcare planning, and ensure appropriate data and information are available for planning and policy development (IOM, 2011)

Adequate PHN staffing has been described as a critical factor in protecting the health and safety of the population at-large (Meagher-Stewart et al., 2010). However, in the U.S., a significant shortage of PHNs has been reported (Quad Council, 2007). In 2005, a case study was conducted in Texas and five other states by the Health Resources and Services Administration (HRSA) to identify important public health workforce trends. Key informants from both state and local public health agencies consistently described ongoing problems with PHN recruitment and retention as their most significant workforce concern (HRSA, 2005).

Major problems with staffing shortages, excessive workloads, program disruptions and family disruptions were experienced during a prolonged Canadian public health response to SARS (Bergeron et al., 2006). Similar staffing concerns were described by 351 nurses and epidemiologists responding to SARS in Taiwan (Tsai & Ya-Ti, 2008). Additionally, in a study of 117 PHNs in the U.S., Frank and Karioth (2006) found that long deployments, long workdays, and family disruption resulted in compassion fatigue for approximately 24% of study participants responding to Hurricane Katrina. Therefore, disaster response should be a major consideration in any assessment of PHN staffing requirements.

To ensure adequate numbers of PHNs to manage population-based public health service requirements, the Association of State and Territorial Directors of Nursing (ASTDN) has recommended a staffing ratio of 1 PHN per 5,000 population in the U.S. This ratio was proposed to ensure adequate numbers of PHNs to provide the following population-focused public health services: emergency preparedness and response, immunizations, targeted home visitation, case management, health teaching and promotion, disease outbreak investigation, community health planning and organizing, and health advocacy (ASTDN, 2007). As an alternative to staffing ratios, it has been recommended that public health agency staffing and service levels be planned based on identified service needs and the availability of other resources to meet those needs in a given community (Derose, Asch, Fielding, & Schuster, 2003).

Autonomy

Job autonomy is critical to productivity and innovation because it ensures that decision-making is in the hands of individuals who have the most knowledge about the situation at hand (Kanter, 1977, 1983; 1993). Based on research conducted in multiple corporations, Kanter (1983) found that organizational innovation, productivity, and quality are contingent upon the autonomous decision-making and rapid action of empowered employees. To act autonomously, employees must have adequate information, resources, and support. Autonomy enables employees to derive meaning from their work and to be creative and innovative. However, autonomous practice also requires a clear delineation of job roles and ongoing coordination with managers and peers.

In a qualitative study of staff nurses (n =289) working in magnet hospitals, Kramer and Schmalenberg (2004c) found that nurses who were engaged in autonomous clinical practice felt empowered to act independently, based on their nursing knowledge and

judgment. Autonomous nurses reported that their actions were supported by hospital management. They also reported being held accountable in a positive and constructive manner.

In a subsequent qualitative study, Kramer and colleagues (2006) interviewed staff nurses, nurse managers, and physicians (n = 191) working in magnet hospitals to further define clinical autonomy. The consensus was that autonomous nursing actions are taken in an environment that requires coordination with other disciplines (primarily physicians) and with peers. Interdependent decision-making is required in situations where spheres of influence overlap (Kramer, Maguire, & Schmalenberg, 2006).

In a third qualitative study, Kramer et al. (2007) conducted interviews with staff nurses, nurse managers, and physicians (n = 267) working in magnet hospitals to identify underlying organizational practices that supported clinical autonomy. Study participants discussed the importance of re-defining or negotiating autonomy and scope of practice to ensure that nurses continue to meet patient needs in a rapidly changing health care environment. Organizational sanction of autonomous nursing practice was found in the use of autonomy as a staff nurse performance measure and as one of the criteria established for career advancement in magnet hospitals.

A high degree of autonomy has been described as an essential component of the PHN work environment (Meagher-Stewart et al., 2010). Campbell et al. (2004) found that PHNs working in local public health agencies in one Midwestern state in the U.S. (n = 192, response rate = 55%) were at least moderately satisfied with the level of control and responsibility they experienced on the job. In a recent nation-wide study in the U.S., 83% of PHNs reported a high degree of autonomy in their jobs (University of Michigan, 2013). Similar findings were reported in two PHN studies in Canada (Best & Thurston,

2006; Betkus & MacLeod, 2004). In one of these Canadian studies (n = 124, response rate = 50.6%), PHNs ranked autonomy as the most important characteristic of the job (Best & Thurston, 2006).

Given the importance of autonomous PHN practice, further research is recommended to determine if PHNs have the level of support for autonomy that is required. As indicated in the business and hospital-based research literature, organizational support for job autonomy could be measured in a number of ways. Self-reported measures could include nurses' perceptions regarding their ability to: perform meaningful work, work to their full potential, feel appreciated for their skills and abilities, make independent, autonomous decisions, coordinate important decisions with managers, other disciplines, and peers, and contribute new ideas (Kanter, 1983, 1993, 2009; Kramer et al., 2006; Kramer et al., 2007; Kramer & Schmalenberg, 2004c).

Teamwork

According to research by Kanter (1983), work teams play a critical role in today's well-functioning organizations. Managers provide leadership, oversight, and "power tools" for their teams. Teams work collaboratively to solve problems and take action. Positive group dynamics are essential to ensuring that teams work efficiently and produce high quality outcomes.

Teamwork also was identified as a critical characteristic of magnet hospital work environments. According to the original magnet hospital study in 1983, high levels of teamwork and collaboration consistently were reported by nursing managers and their staffs. Staff nurses described excellent working relationships with their nursing peers. Mutual respect and collaboration also generally were reported between nurses and other departments and disciplines. However, RN-MD relationships sometimes were less than

optimal, due to an imbalance of power. In these situations, nurses received strong support from their managers in attempting to build collaboration and resolve potential conflicts (McClure, 1983).

More recently, positive outcomes from effective teamwork and interdisciplinary collaboration were reported in the hospital nursing literature. In a review of the emergency department literature, Kilner and Sheppard (2010) found that teamwork and communication affected four main areas: improved patient access, reduced clinical errors, enhanced patient satisfaction, and increased staff job satisfaction. Through extensive research in multiple health care settings, Stamps (1997) found that good teamwork also involved a number of interactions, including: peers pitching in to help one another, helping new employees to feel at home, interdisciplinary collaboration, and mutual respect for knowledge and skills.

In a cross-sectional survey of 2,216 nurses working in hospitals in the U.S. (response rate = 60%), Kalisch and Lee (2010) found that good teamwork was essential to patient safety and quality of care. Furthermore, key components of teamwork were described as: team leadership (either formal or informal), a mutual team focus, awareness/observation of other team members, providing backup to other team members when needed, an ability to adapt to change, a mutual understanding of what is required to complete the work, an active information exchange, and an environment of mutual trust. Furthermore, teamwork was found to be significantly inversely correlated with episodes of missed care ($r = -.37$, $p \leq .01$).

In a nation-wide study in Canada, PHNs reported they placed a great deal of value on teamwork and interdisciplinary collaboration (Meagher-Stewart et al., 2010). In fact, teamwork and co-worker interactions consistently have been reported as positive findings

in the PHN literature. However, specific details regarding team interactions were not provided (Armstrong-Stassen & Cameron, 2005; Best & Thurston, 2006; Betkus & MacLeod, 2004; Campbell et al., 2004; Cole et al., 2010; Cumbey & Alexander, 1998).

Given the importance of effective teamwork to overall organizational quality and the limited number of PHN studies that have addressed this important issue, it is clear that further research is needed. At a minimum, it would be important to evaluate team interactions, including the extent to which: co-workers help one another when needed, new employees are made to feel at home, interdisciplinary collaboration is emphasized, and team members have a mutual respect for knowledge and skills (Kalisch & Lee, 2010; Stamps, 1997). Findings from such research would enable leaders to develop strategic interventions should any problems be identified.

Practice Model

Highly successful organizations place decisions related to professional practice under the control of employees. Kanter (1977, 1983, 1993, 2009) documented the transition of successful corporations from bureaucratic structures to flexible organizations that empower employees in cross-organization work teams and standing committees to perform a number of functions related to their professional practice. Such organizations recognize the vital importance of employee involvement at all levels in organization-wide innovation and change.

From the earliest days of magnet hospital research, staff nurses reported that they have authority and responsibility for controlling important matters pertaining to their professional practice. They have been invited to provide input regarding relevant policy matters, such as competitive pay, flexible scheduling, and opportunities for promotion. They also were given the opportunity to participate directly in decision making through

membership in committees that address professional standards of practice and overall hospital governance (McClure et al., 1983; Thomas & Herrin, 2008).

Based on findings from a large grounded theory study, Kramer and Schmalenberg (2004a) described control of nursing practice (CNP) as more than simply monitoring compliance with legal mandates. Such control also meant nursing involvement in planning and decision making regarding clinical and policy issues that affected their practice. Ultimately, CNP was considered to take place when staff assumed responsibility for recognizable outcomes and when administrators and other health professionals acknowledged that nurses had this responsibility. An organization-wide shared governance model was considered an ideal model for CNP.

Shared governance is a framework for CNP that first was proposed by Porter O'Grady and Finnigan (1984). The basic premise was that work productivity is increased and meaningful innovation takes place when management and professional staff collaborate as partners. A multi-council or committee structure was recommended, which could be configured in several ways. One suggested model included: an oversight or coordinating council, a practice council, an education council, a quality improvement council, and a council for organizational policies and management practices. Regardless of the model employed, organizations were thought to be most efficient when all nurses had an opportunity to participate in governance and a high degree of authority and responsibility for decision making was delegated to councils or committees (Porter O'Grady, 1992, 2009; Porter O'Grady & Finnigan, 1984).

The PHN literature suggests that a shared governance model would be appropriate within the public health setting. In a study of 192 PHNs in the U.S., Campbell et al. (2004) found that job satisfaction was positively associated with both horizontal integration of

decision-making among peers and (r = .66, p $\leq$ .001) and vertical integration of decision-making between staff and management (r = .53, $r \leq$ .001). Furthermore, in a cross-sectional survey in New Zealand, Hansen et al. (2007) found that PHNs (n = 485, response rate = 46%) had significant concerns about major health system changes that were being made without their input. They advocated for increased involvement in the decision-making process to ensure that essential PHN services would continue to be provided.

In a qualitative study of PHNs in the U.S. (n = 57), Skillen et al. (2001) found that personal safety was a major concern requiring further attention at the organizational planning and policy level. It was recommended that an occupational health and safety committee be established with PHN representation (Skillen, Olson, & Gilbert, 2001). In a study of PHNs in Taiwan (n = 312), Hsu et al. (2006) found that home quarantine measures to control SARS were hampered by safety concerns, poor interagency communication, lack of standard operating procedures, and lack of flexibility to respond to rapidly changing conditions. Bergeron et al. (2006) reported similar findings in their qualitative study of PHNs (n = 941) involved in the SARS response in Canada. A recommendation was made to include PHNs in disaster preparedness planning.

Based on the research literature, it seems clear that PHNs believe they should have significant influence over major organizational issues that affect their nursing practice (Bergeron et al., 2006; Campbell et al., 2004; Hansen et al., 2007; Hsu et al., 2006; Skillen et al., 2001). A shared governance model would provide this level of direct employee involvement in decision-making regarding such issues as educational support, professional practice, and organizational policies and planning (Porter O'Grady, 1992, 2009). The hospital and business research literature demonstrates the value of this level of direct employee involvement to the overall quality and success of an organization (Kanter, 1977,

1983, 1993, 2009; McClure et al., 1983; Thomas & Herrin, 2008). Given the limited number of PHN studies regarding this issue, further research is needed. Findings from such research would enable public health leaders to determine whether their agencies provide sufficient opportunities for PHN decisional-involvement or further changes are warranted.

Service Excellence

In numerous case studies from the business sector, Kanter (1977, 1983, 1993, 2009) found that a focus on quality was essential to corporate success in an increasingly global economy. An organizational focus on service excellence required maintaining an in-depth knowledge of changing market conditions and customer needs, as well as a spirit of creativity and innovation. Meaningful change was found to occur through a process of assessment, planning, implementation, and evaluation. Continuous quality improvement required the involvement and "buy in" of corporate leaders, managers, and employees at all levels.

Hospitals included in the original magnet hospital study were chosen for participation based on their reputation for providing high quality patient care. Researchers found that managers in these magnet hospitals held staff nurses responsible and accountable for the quality of services delivered. Moreover, nurses held themselves and their peers to a high standard of nursing practice. Organization-wide systems were put in place to monitor and improve patient care quality and outcomes (McClure et al., 1983). In a more recent study, a patient-centered focus and a culture of service excellence were distinguishing features of magnet hospitals (Kramer, Schmalenberg, & Maguire, 2004).

In the public health setting, a focus on service excellence is considered to be critical to job satisfaction and the optimal use of PHNs (Hansen et al., 2007; Meagher-Stewart et

al., 2010). In 1998, a landmark report by the Minnesota Department of Health to provide specific guidance to PHNs in providing public health services at the individual/family, community, and health systems levels. The following were listed as examples of such services that that fall within the scope of PHN practice: surveillance, disease/health hazard investigation, outreach, screening, case finding, referral and follow-up, case management, delegated direct care tasks, health education, social marketing, counseling, consultation/problem solving, collaboration, community organizing, coalition building, advocacy, policy development, and policy enforcement (Keller et al.,, 2004). Subsequent research at the national level provided numerous examples of successful PHN interventions based on the Minnesota model. However, although interventions were tied to desired outcomes at the individual/family level, demonstrated links to community and systems outcomes remained a challenge (Keller et al., 2004).

A newly implemented public health agency accreditation process places a strong emphasis on developing a culture of service excellence. The Joint Commission process for accrediting hospitals and other healthcare organizations was described as a model for the public health accreditation process (Leep, Beitsch, Gorenflo, Solomon, & Brooks, 2009; Riley, Bender, & Lownik. (2012). National standards were established by the Public Health Accreditation Board (PHAB) to measure public health agency performance with respect to the following: assessing community health needs, investigating health problems and health hazards, informing and educating the public about health issues, engaging community partners in addressing health problems, developing and implementing policies and plans, proposing and enforcing laws to protect the public's health, developing and implementing strategies to improve access to care, maintaining a competent workforce, developing and implementing systems for continuous quality improvement, identifying

best practices and an evidence base for decision-making, maintaining administrative and management support for public health practice, and engaging governing bodies in efforts to improve the public's health. To ensure organizational capacity to meet these standards, an assessment of the work environment and work environment outcomes is required (PHAB, 2013).

Work Environment Research Considerations

As demonstrated in the hospital-based nursing literature, comprehensive studies of the work environment provide valuable information about organizational strengths in supporting nursing practice, as well as opportunities for improvement in systems that affect job satisfaction and service quality (Aiken & Patrician, 2000; Kramer & Schmalenberg, 2004a; Lake, 2002; McClure & Hinshaw, 2002; McClure et al., 1983; Schmalenberg & Kramer, 2008a; Stamps, 1997). As demonstrated by this review of the literature, such studies should, at a minimum, measure the following critical characteristics of the PHN work environment: management support, professional growth, staffing adequacy, job autonomy, teamwork, service excellence, and control over nursing practice.

Based on recent studies of the public health work environment identified in this review of the literature, it appears that PHNs generally experienced a high degree of satisfaction with interdisciplinary teamwork and job autonomy (Best & Thurston, 2006; Campbell et al., 2004). On the other hand, management support, professional growth, staffing adequacy, service excellence, and control over nursing practice are work environment characteristics that may require further attention (Bergeron et al., 2006; Frank & Karioth, 2006; Guo et al., 2008; Hansen et al., 2007; Hill et al., 2010; Hsu et al., 2006; Issel et al., 2006; Lee & Wang, 2002; Lin et al., 2010; Meagher-Stewart et al., 2010; Skillen et al., 2001; Tsai & Ya-Ti, 2008). However, given the limited number of studies

reporting concerns about these issues, further research is needed to determine the extent to which these findings hold true for PHNs in Texas and in the U.S. as a whole.

Work Environment Outcomes Research

Job satisfaction, organizational commitment, and intent-to-stay are three self-reported outcomes that are used to identify factors related to work environment quality that contribute to job vacancy and turnover rates (Aiken & Patrician, 2000; Coomber & Barriball, 2007; Hayes et al., 2006; Hayes et al., 2012). Numerous studies have demonstrated the importance of monitoring such self-reported work environment outcomes and taking corrective action as problems are identified (Aiken & Patrician, 2000; Hayes et al., 2006; Hayes et al., 2012; Irvine & Evans, 1995; Lake, 2002; Price & Mueller, 1986a). If such problems are not corrected, the following have been identified as potential economic and non-economic consequences: a lack of qualified candidates to replace lost staff due to a global nursing shortage, reduced organizational capacity to provide needed services, burnout in remaining staff who are overburdened with increased workload demands, and substantial monetary costs incurred as each new nurse is recruited and trained (Jones & Gates, 2007; Leveck & Jones, 1996). The following is an in-depth review of the research literature regarding each of these work environment outcomes.

JOB SATISFACTION

Job satisfaction describes the extent to which employees like their jobs (Hoppock, 1935; Price & Mueller, 1986a; Spector, 1985). Two types of job satisfaction research have been described. The first actually measures employees' perceptions regarding facets (i.e., process characteristics) of the work environment, with the resulting data used as a proxy measure of job satisfaction. The second type of research uses a separate instrument to

measure global perceptions regarding job satisfaction. Instruments used to measure global perceptions have varied from single-item questions to multi-item scales (Brown & Peterson, 1993; McNichols, Stahl, & Manley, 1978; Tett & Meyer, 1993).

Hoppock is recognized for his early empirical research on the global measurement of job satisfaction. In a mixed methods study, Hoppock (1935) first interviewed 40 individuals who worked in a variety of occupations to gain information about personal attributes, perceived working conditions, and factors most closely associated with feelings of satisfaction or dissatisfaction regarding the job. From those interviews, Hoppock concluded that job satisfaction was the product of a variety of factors, including personal attitudes, socioeconomic status, length of service, working conditions, skills and abilities, and documented success on the job.

After analysis of information gained from individual interviews, Hoppock developed a research tool to conduct a survey of work environment characteristics of 500 teachers in 51 urban and rural communities. One scale in this survey was specifically developed to measure job satisfaction as determined by: how much of the time the employee felt satisfied with his/her job, how well the employee liked his/her job, whether the employee had considered changing jobs, and how the employee felt he/she compared to others with regard to the level of job satisfaction experienced. Data were analyzed to determine factors within the work environment that were most closely associated with job satisfaction or dissatisfaction. The report of findings generated from that study provided a number of indications for targeted interventions to improve job satisfaction (Hoppock, 1935).

In a classic study in the hospital setting, Price and Mueller (1986a) developed a causal model for voluntary turnover. Based on the turnover literature, survey tools were generated and administered in a longitudinal study of 1,688 staff in five hospitals (n = 2,192, response rate = 54.2%), A separate set of global measures was used to assess employees' perceptions of the work environment, job satisfaction, organizational commitment, and intent to stay or leave. Hospital turnover was also measured. The resulting data were subjected to correlational analysis, multiple regression analysis, and path analysis. These analyses resulted in the following being identified as determinants of job satisfaction or dissatisfaction: opportunity for alternative jobs, routinization (or repetitiveness of the job), centralization of power in the organization, instrumental communication about the job through formal channels, integration with other team members, pay, distributive justice (i.e., perceived equity in pay and other rewards), promotional opportunities, professionalism, kinship/community responsibility, and size of work unit. A causal model was developed from the survey data. A satisfaction-to-commitment serial mediation model was shown to predict employees' perceptions regarding intent to say or leave. In turn, intent to leave was shown to predict voluntary turnover. Moderating influences also were tested; centralization was found to negatively influence job satisfaction for long-term employees, as well as for other employees who had high opportunity for alternate employment.

Meta-analyses and systematic reviews provided a number of important findings regarding determinants of job satisfaction as a global measure. An early meta-analysis was conducted by Blegen (1993). Forty-eight nursing studies involving 15,048 participants met criteria for inclusion. Weighted mean correlations were calculated to compare the statistically significant relationships between job satisfaction and a number of other

variables across studies. A large positive relationship was reported between job satisfaction and organizational commitment (r = .53), although a large negative relationship was reported between job satisfaction and stress (r = -.61). The following variables were reported to be moderately correlated with job satisfaction: communication with supervisor (r = .45), autonomy (r = .42), recognition (r = .42), routinization (r = -.41), communication with peers (r = .36), and fairness/distributive justice (r = .30). Small correlation coefficients were reported between job satisfaction and two additional variables: locus of control (r = .28), and nurse's age (r = .13).

A second early meta-analysis was performed by Tett and Meyer (1993) was conducted to evaluate the relationships between job satisfaction, organizational commitment, turnover intention, and turnover. In total, 178 independent samples from 155 studies were used to conduct this analysis. Job satisfaction was shown to be moderately correlated with intent to stay (r = .58).

A third early meta-analysis was performed by Irvine and Evans (1995) to evaluate relationships between hospital nurses' job satisfaction, work environment characteristics, and other outcome variables. Price and Mueller's causal model (1981) was used to guide the research. Ultimately, 18 studies were selected for analysis. Weighted mean correlations were calculated to compare statistically significant relationships between job satisfaction and other study variables. Moderate correlations were reported between job satisfaction and: supervisor relationship (n = 4,337, r = .51), leadership (n = 3,965, r = .51), and routinization (n = 2,151, r = -.52). Low correlations were reported between job satisfaction and participation (n = 1,840, r = .35), feedback (n = 1,276, r = .38), advancement opportunity (n = 3,044, r = .38), autonomy (n = 5,332, r = .46), role conflict (n = 2,912, r = -.35), role ambiguity (n = 2,606, r = -.33), and intent-to- stay

(n = 1,957, r = .43). Finally, weak correlations were reported between job satisfaction and pay (n = 4,368, r = .23), work overload (n = 2,031, r = -.16), and job opportunities (n = 1,730, r = -.13).

A recent review of the nursing research literature was conducted by Hayes et al. (2006) to identify the determinants and outcomes of turnover. A total of 130 studies were included in that analysis. A number of recurrent themes were identified regarding voluntary turnover and its effects on nurses, patients, and systems. For example, dissatisfaction with the job often was causally linked to turnover, particularly in young and highly educated nurses who voiced numerous concerns. Excessive workloads increased job stress and burnout, which, in turn, resulted in decreased job satisfaction and increased turnover rates. On the other hand, effective leadership improved job satisfaction and retention, especially through scheduling flexibility, enhanced staff autonomy, enhanced career mobility, collaborative working relationships, and a participative management style.

A recent meta-analysis of nurses' job satisfaction was conducted by Zangaro and Soeken (2007) to describe the relationships between job satisfaction, work environment factors, and other work environment outcomes. A total of 31 studies were included in the final analysis. Weighted mean correlations were calculated to evaluate relationships across studies. Low correlations were found between job satisfaction and: job stress (n = 11,349, r = -.43), autonomy (n = 8,393, r = .30), and RN-MD collaboration (n = 3,641, r = .37).

Recent large-scale nursing studies have served as another source of valuable information about job satisfaction. Aiken and colleagues (2002) conducted a large, cross-sectional survey of staff nurses in the U.S. (n = 10,184) who worked on medical-surgical units in adult general hospitals (n = 168). The purpose of the study was to evaluate nurse staffing, nurse burnout, and job dissatisfaction. Staff nurses routinely working with an 8:1

patient-to-nurse ratio were estimated to be 2.29 times more likely to experience burnout and 1.7 times more likely to be dissatisfied with their jobs than those working with a 4:1 patient-to-nursing ratio (Aiken et al., 2002).

Subsequently, Schmalenberg and Kramer (2008a) performed a secondary analysis of aggregated data from studies of staff nurses in magnate and magnate-aspiring hospitals (n = 10,514) to evaluate relationships between work environment characteristics, job satisfaction, and quality of care. Correlation coefficients were calculated for all key variables. All relationships were found to be positive and significant ($p \leq .01$). Variables found to be moderately correlated with overall job satisfaction were as follows: quality of patient care (r = .62), the global work environment score (r = .61), patient-centered values (r = .57), nurse manager support (r = .54), and staffing adequacy (r = .53). Somewhat lower correlations were found between job satisfaction and other work environment characteristics that were measured: autonomy (r = .49), support for education (r = .48), control over nursing practice (r = .46), clinically competent peers (r = .45), and RN-MD relationships (r = .37). The researchers believed these findings indicated that greatest degree of job satisfaction was experienced when nurses felt their organization supported them in providing a high level of service quality (Schmalenberg & Kramer, 2008a).

More recently, Kelly and colleagues (2011) surveyed 26,276 nurses in 567 acute care hospitals to evaluate perceptions regarding work environment quality, job satisfaction, and burnout in magnet and non-magnet hospitals. Magnet hospital nurses rated the quality of their work environments to be significantly greater (t = -5.29, $p \leq .05$) than their non-magnet counterparts. In addition, magnet hospital nurses reported being 13% less likely to experience burnout ($p \leq .05$) and 18% less likely to be dissatisfied with their jobs ($p \leq .05$) (Kelly et al., 2011).

Public health nursing job satisfaction research

Only a few recent PHN studies separately measured job satisfaction as a work environment outcome. Two of these studies were conducted in Taiwan. In the first of these studies (n = 231, response rate = 87%), Chu and colleagues (2006) found a statistically significant relationship between PHNs' job satisfaction and organizational commitment (r =.55, $p \leq .01$) (Chu, Lee, & Hsu, 2006). In a second study (n = 258, response rate = 90%), Lu and colleagues (2007) found that PHNs' job satisfaction was positively related to professional commitment (r = .54,) and negatively related to work stress (r = -.29) (Lu, Chang, & Wu, 2007).

Public health nurses were included in one recent unpublished study of the work environment and outcomes pertaining to nurses working in all healthcare settings in one Northeastern U.S. state. Out of a total of 22,406 nurses that returned completed surveys, only 396 (or about 2%) were PHNs. Of the PHN respondents, 42% reported being highly satisfied with their jobs. However, 11% of PHNs highly dissatisfied. Approximately 30% of PHNs described their work environment as fair-to-poor. In addition, 19% of PHNs reported burnout and 16% planned to leave or retire. Statistically significant predictors of PHN job satisfaction were identified as follows: the quality of the overall work environment (β =.31, $p \leq .000$), professional status (β=.17, p=.000), opportunities for advancement (β =14, $p \leq .01$), personal accomplishment (β =.13, $p \leq .000$), job autonomy (β =13, $p \leq .000$), and burnout (β = - 24, $p \leq .000$). The researcher suggested that public health leaders pay particular attention to the reduction of employee burnout, work overload, role conflict, and role ambiguity. Further PHN work environment research was recommended (Flynn, 2007b).

A separate global measure of job satisfaction was included in a nation-wide PHN survey recently conducted in the U.S (n = 2,700, response rate = 35%). Approximately 85% of PHNs in the survey sample reported a high level of job satisfaction. This same percentage said they would recommend a career in public health to nursing students. However, no relationships were described between job satisfaction and the PHN work environment (University of Michigan, 2013).

In 2014, a nation-wide survey was conducted to determine the job satisfaction of employees who worked in state public health agencies in the U.S (n = 10,246, response rate = 46%). Supervisory support ($\beta = 4.25$, p =.00), organizational support ($\beta = 6.75$, p =.00), and supervisor ($\beta = 1.01$, p =.00), manager ($\beta = 1.12$, p =.01), or executive level position ($\beta = 1.34$, p =.05) were found to serve as predictors of job satisfaction. However, findings that specifically related to PHN job satisfaction were not provided (Harper et al., 2015).

In summary, job satisfaction is a self-reported outcome frequently measured in hospital-based studies designed to identify factors that may contribute to job vacancy and turnover rates (Aiken et al., 2002; Blegen, 1993; Hayes et al., 2006; Irvine & Evans, 1995; Kelly et al., 2011; Price & Mueller, 1986a; Schmalenberg & Kramer, 2008a; Zangaro & Soeken, 2007). As suggested by a recent multi-state case study, public health agencies appear to have far greater difficulty in recruiting and retaining qualified nurses than their hospital counterparts (HRSA, 2005). However, little currently is known about factors within the work environment that result in PHN job satisfaction or dissatisfaction. Therefore, the inclusion of global job satisfaction as an outcome measure should be considered in future PHN work environment research.

ORGANIZATIONAL COMMITMENT

Porter and colleagues (1974) described organizational commitment as a belief in organizational values and goals, a willingness to expend considerable effort, and a strong desire to maintain membership (Porter et al., 1974). Allen and Meyer (1990) built on that work and proposed a separate three-component model. Affective commitment is the first component. This was defined as an employee's emotional attachment. Continuance commitment is the second component. This was defined as a resolve to continue working because of the high costs associated with losing membership. Normative commitment was the final component. This was defined as a sense of obligation that an employee feels to the organization. Commitment to an organization for any of these reasons was thought to make it unlikely for an employee to leave (Allen & Meyer, 1990).

In a qualitative study conducted by the Mississippi Office of Nursing Workforce (MONW), organizational commitment was described from the perspective of nurses and administrators *(n* = 170) who worked in multiple healthcare settings. Emotional attachment to the organization was deemed to represent one end of the scale. However, concerns regarding stress and burnout also were deemed important because they affected the level of commitment that nurses experienced (W. Jones, personal communication, July 22, 2010).

Commitment

The research literature provides a vast amount of information regarding the determinants and consequences of an employee's commitment to the organization. In a multi-hospital study by Price and Mueller (1986a) (*n* = 2,192, response rate = 54.2%), a causal model was developed that identified the following as determinants of job organizational commitment: alternative job opportunities, centralization of power,

instrumental communication about the job, integration with other team members, family income, distributive justice, promotional opportunities, professionalism, training, size of hospital, size of work unit, and global job satisfaction score. As previously mentioned, a satisfaction-to-commitment serial mediation model was shown to predict intent to say or leave, which, in turn, predicted turnover. Pay was found to have a moderating effect on level of commitment, but only for long-term employees (Price & Mueller, 1986a).

A number of meta-analyses of relevant studies were identified. In the first meta-analysis, Mathieu and Zajac (1990) evaluated a total of 124 published studies and 174 independent samples to identify antecedents, correlates, and consequences of organizational commitment. Antecedents included personal characteristics, role attributes, job characteristics, group/leader relations, and organizational characteristics. Correlates included motivation and job satisfaction. Consequences included job performance, intent to stay/leave, absenteeism, and turnover. A number of studies reported that both job satisfaction and organizational commitment mediated causal relationships between personal characteristics or work processes and intent to stay or leave. Further evaluation of moderating influences was recommended.

In a meta-analysis of 30 studies involving 41 population samples in the business sector, Cohen (1991) investigated the effects of career stage on the relationship between organizational commitment, turnover intentions, performance, and absenteeism. A number of significant findings were identified. For example, the relationship between organizational commitment and actual turnover was higher in the early career stage (r = -.49) than later in a career (r = -.23). Statistically significant but low correlations also were found between organizational commitment and absenteeism (r=.27), as well as to performance (r = .32) in later stages of an employee's career.

Cohen (1992) performed a second meta-analysis of the business literature to identify relationships between organizational commitment and the following antecedents: personal characteristics, role characteristics, structural characteristics of the organization, and work experiences. The final analysis included 77 research articles and 99 separate samples. For white collar employees, the relationship between autonomy and organizational commitment (r = .05) was much higher than for their blue collar counterparts (r = .02). Role ambiguity was reported to have a statistically significant negative relationship to organizational commitment in blue collar workers, although the magnitude of this relationship was not reported.

In a meta-analysis of research literature in the social sciences, Tett and Meyer (1993) compared the influences of job satisfaction and organizational commitment on turnover intention and actual turnover. Specific criteria for inclusion in the meta-analysis were established for findings related to organizational commitment, with only studies using some form of the Organizational Commitment Questionnaire (OCQ) considered for analysis. However, broader criteria were considered for measures of job satisfaction, with studies of both facet and global satisfaction included. Based on these criteria, 155 studies and 178 independent samples were included in the analysis. Both job satisfaction and organizational commitment were found to mediate turnover intention. However, satisfaction-to-commitment serial mediation could not be verified.

In a meta-analysis of data in the business literature, Cohen and Gattiker (1994) analyzed the relationship between pay satisfaction and organizational commitment. Based on a literature search, 23 articles and 31 independent samples met criteria for inclusion. Pay satisfaction was found to have a significantly stronger relationship to organizational commitment in private organizations (r = .45) than in public organizations (r = .12). The

relationship between pay satisfaction and organizational commitment also was stronger in small to medium organizations, although the difference was not statistically significant.

Ingersoll and colleagues (2002) conducted a random sample survey of nurses in one Northeastern state in the U.S. (n = 1,575, response rate = 85%) to identify the relationship between selected work environment characteristics and a number of work environment outcomes. Organizational commitment was found to be moderately correlated to organizational policies (r = .58, $p \leq .0001$) and autonomy (r = .55, $p \leq .0001$). Interaction (r = .48, $p \leq .0001$), professional status (r = .43, $p \leq .0001$), task requirements (r = .48, $p \leq .0001$), and pay all demonstrated small but statistically significant relationships with organizational commitment. Job satisfaction and organizational commitment also were found to be moderately positively related to one another (r = .63, $p \leq .0001$) (Ingersoll, Olsan, Drew-Cates, DeVinney, & Davies, 2002).

Concerns

Maslach and Jackson (1981) conducted a study with health and human service workers (n = 605) to identify important aspects of the burnout syndrome. Stress, fatigue, frustration, and emotional exhaustion were identified as major burnout symptoms. Furthermore, depersonalization was determined to be a related concern. On the other hand, perceptions of personal accomplishment were found to be more prevalent when symptoms of burnout were absent.

Aiken and colleagues (2002) conducted a large, cross-sectional survey of hospital staff nurses in the U.S. (n = 10,184). This study evaluated nurse staffing in relation to symptoms of burnout. Staff nurses routinely working with an 8:1 patient-to-nurse ratio were estimated to be 2.29 times more likely to experience burnout than those working with a 4:1 patient-to-nursing ratio (Aiken et al., 2002).

Leiter and Laschinger (2006) conducted a study of hospital-based nurses in Canada (n = 8,597) to evaluate the relationship between characteristics of the nursing work environment and burnout. A direct pathway was found between perceived staffing adequacy and perceived levels of burnout and emotional exhaustion. Two variables were found to serve as direct antecedents to this relationship: perceived levels of nursing management/leadership and the use of a nurse–directed model of care.

Public health nursing organizational commitment research

Organizational commitment was used as an outcome variable in one recent cross-sectional survey of PHNs in Taiwan (n = 231, response rate = 87%). The researchers aimed to identify strategies to reduce PHN turnover, particularly in rural areas. Statistically significant relationships ($p \leq .01$) were reported between PHN organizational commitment and two independent variables: supervisor support (r = .54), and role conflict (r = -.45). Organizational commitment also was positively correlated with two work environment outcomes: job satisfaction (r = .55), and organizational citizenship behaviors (r = .23). The researchers concluded that supervisor support and clear role expectations were critical to retaining PHNs who are productive, supportive to peers, and committed to their jobs (Chu et al., 2006).

Burnout measures were included in one recent unpublished study of the work environment and outcomes pertaining PHNs and nurses in other healthcare settings in one Northeastern U.S. state. Out of a total of 22,406 nurses that returned completed surveys, only 396 (or about 2%) were PHNs. Of the PHN respondents, 42% reported being highly satisfied with their jobs. However, 11% of PHNs were highly dissatisfied and approximately 30% of PHNs described their work environment as fair-to-poor. In addition,

19% of PHNs reported burnout and 16% planned to leave or retire. Burnout was identified as a statistically significant predictor of PHN job satisfaction ($\beta = -.24$, $p \leq .000$) (Flynn, 2007b).

In summary, much like job satisfaction, organizational commitment is a self-reported outcome frequently measured to identify factors related to work environment quality that may contribute to job vacancy and turnover rates (Cohen, 1991, 1992; Cohen & Gattiker, 1994; Ingersoll et al., 2002; Mathieu & Zajac, 1990; Price & Mueller, 1986a; Tett & Meyer, 1993). However, little currently is known about PHN personal characteristics or factors within the work environment that contribute to organizational commitment. Therefore, inclusion of organizational commitment as an outcome measure should also be considered in future PHN work environment research.

INTENT TO STAY

Intent-to-stay is defined as an employee's perception of the likelihood of remaining employed with or leaving an organization (Price & Mueller, 1981). Nursing studies frequently use intent-to-stay measures as predictors of voluntary turnover (Hayes et al., 2006). Failure to identify and correct underlying problems that lead to high rates of turnover can result in staffing inadequacy, service disruption, poor service quality, and potential errors. These conditions also are likely to result in stress and burnout for remaining nurses who try to compensate for staff shortages (O'Brien-Pallas, Murphy, Shamian Xiaoqiang & Hayes, 2010).

The classic study by Price and Mueller (1986a) was designed to identify antecedents of absenteeism and turnover in the hospital setting. A causal model for that large longitudinal study (n = 1,688, response rate = 46.5%) identified the following as direct antecedents of intent to stay: alternate job opportunities, instrumental

communication, team integration, pay, community/kinship responsibility, job satisfaction, and organizational commitment. However, path analysis also revealed satisfaction-to-commitment serial mediation in the causal relationship between a number of variables within the work environment and intent to stay/leave (Price & Mueller, 1986a; Teltt & Meyer, 1993). Intent to leave was the most influential variable in the prediction of turnover. For employees with low kinship responsibilities, promotional opportunities were found to have a moderating influence on commitment.

More recently, Ingersoll and colleagues (2002) conducted a nursing survey in one Northeastern state in the U.S. (n = 1,575, response rate = 85%) to identify determinants of turnover intent. The following were found to increase likelihood of turnover within five years: age > 50 years, employment in a rural community, type of work setting (i.e., administration, community health, gerontology, or rehabilitation), level of job satisfaction, and level of organizational commitment (Ingersoll et al., 2002).

In a large systematic review, Hayes et al. (2006) examined the state of current knowledge regarding factors associated with nursing turnover/turnover intent. Ultimately, 130 studies met criteria for inclusion in the review. Excessive workloads consistently were found to increase job stress and burnout, which, in turn, had a direct effect on turnover. Other factors, such as empowerment, professional commitment, job embeddedness, pay, and personality style, appeared to play an indirect role by influencing nurses' perceptions of their intent-to-stay.

In a smaller systematic review, Coomber and Barriball (2007) evaluated the effects of personnel characteristics and satisfaction with job facets (i.e., work environment characteristics) in relation to turnover intent and actual turnover of nurses. Nine studies met criteria for inclusion in this study. A number of recurrent themes were identified. For

example, leadership and management support were found to be instrumental to both intent to stay and the rate of voluntary turnover. Stress exerted the most influence over intent to leave.

Cowden and colleagues (2011) conducted a systematic review to determine how leadership practices influenced staff nurses' intent-to-stay. Twenty-three articles met criteria for inclusion in the review. Intent-to-stay was found to be significantly higher when mangers sought nurses' opinions, involved staff in decision-making, and facilitated group cohesion. However, lack of control over practice was a significant negative predictor of intent-to-stay (Cowden, Cummings, & Profetto-Mcgrath, 2011).

More recently, Hayes and colleagues (2012) conducted an updated review of the literature to identify the determinants and consequences of nursing turnover and/or turnover intent. A total of 68 studies were included in this study. Determinants of turnover were characterized as: factors relating to organizational climate, nursing workload, stress and burnout, leadership/management support, employee empowerment (i.e., access to information, support, resources, and growth opportunities), a good balance between role clarity and autonomy, opportunities for career advancement and good pay/benefits, and personal factors, such as age, career stage, family responsibilities, etc. Consequences of turnover were described as: reduced service quality, adverse patient outcomes, and economic impact (i.e., cost to the organization each time an employee must be replaced) (Hayes et al., 2012).

Public health nursing intent-to-stay research

Findings regarding leaving intent only were identified in three studies that included PHNs. In the first of these studies, Betkus and MacLeod (2004) asked PHNs in one Canadian province (n = 124, response rate = 76%) to estimate how long they planned to

stay on the job and what would influence their decision to stay or leave. The majority of respondents (52%) reported they planned to stay for five or more years. Another 20% of respondents planned to stay at least 2-4 years. However, 28% of respondents planned to leave in two years or less. Of those planning to leave within two years, 43% were aged 35 years or less. Comments regarding leaving intention primarily revolved around challenges encountered when working in rural communities, including feelings of isolation when performing the work, lack of community amenities, and personal circumstances not associated with the job.

A second PHN study included one question about leaving intent. As part of a survey of local public health staff nurses mangers in a Midwestern state in the U.S. (n = 192, response rate 55%), participants were asked whether or not they planned to continue working for their current employer. Virtually all (98%) said they planned to stay. Of those who gave an explanation for their response, the primary reasons given were enjoyment of work (28%) and flexible schedules (6%) (Campbell et al., 2004).

The third study involved a survey of PHNs and other public health staff working in state agencies throughout the U.S. (n = 10,246, response rate = 46%). Logistic regression was used to examine predictors of intent to leave within the next year. Higher odds of leaving were found for employees who reported racial/ethnic minority status, short tenure in the job, and working in a Western state. On the other hand, those who perceived greater job satisfaction, organizational support, and pay satisfaction had greater odds of reporting they intended to stay (Liss-Levenson, Bharthapudi, Leider, & Sellers).

In summary, intent-to-stay research provides important information about voluntary employee turnover and the root causes of leaving intentions. Armed with these data, employers would have an opportunity to target areas for organizational improvement

to maximize staff retention. Given reported problems with PHN recruitment and retention, intent-to-stay research could be of great value to public health agencies. The limited information available from current PHN studies suggests that further research is needed.

Chapter Summary

Research showed that hospitals with healthy and productive work environments had great success in recruiting and retaining staff nurses, particularly during times of nursing shortage (Cohen, Stuenkel, & Nguyen, 2009; Kramer & Schmalenberg, 2008a; Leiter & Maslach, 2009; Leveck & Jones, 1996). Also, work environment characteristics were linked to critical work environment outcomes, such as job satisfaction, organizational commitment, and intent-to-stay in both the business and hospital setting (Aiken et al., 2001; Blegen, 1993; Cohen et al., 2009; Coomber & Barriball, 2007; Gregory et al., 2007; Hayes et al., 2006; Kramer & Schmalenberg, 2008a; Leiter & Maslach, 2009; Leveck & Jones, 1996). Furthermore, links have established between the work environment, job vacancies, and turnover rates (Hayes et al., 2006; Jones & Gates, 2007; Leiter & Maslach, 2009; Leveck & Jones, 1996; Price & Mueller, 1986a). Although a preliminary analysis suggested that similarities exist between business, hospital, and PHN work environments, further research is required to more fully understand dynamics within the public health setting. This is especially important as the U.S. proceeds with a health care reform agenda that will require greater PHN involvement (IOM, 2011).

Significant gaps in knowledge exist regarding PHN work environment quality. There also is limited information regarding the relationship between the PHN work environment and three self-reported work environment outcomes deemed most critical to measure: organizational commitment, job satisfaction, and intent-to-stay. This study

explored the PHN work environment and critical work environment outcomes in Texas. Instruments developed for the hospital setting were adapted for use in the public health setting. Further information about these instruments and the study methodology will be provided in the next chapter.

CHAPTER 3: METHODOLOGY

The purpose of this chapter is to describe the methods used to study the public health nursing work environment and workforce outcomes in Texas. This includes an overview of the research design, sample, selection criteria, data collection methods, research instruments used, and methods employed for data analysis. The chapter concludes with a description of procedures used to ensure the protection of human subjects.

Research Design

This study was conducted from Fall 2013 to Spring 2014 as a prospective cross-sectional online survey of public health nurses in Texas. Demographic data were collected to gain a better understanding of PHN characteristics and job roles. Subjects were asked to rate their perceptions regarding critical characteristics of the work environment within their public health agency. Three work environment outcomes also were measured: organizational commitment; job satisfaction; and intent to stay.

Critical characteristics of the public health nursing (PHN) work environment previously were determined through a review of the research literature (Dingley & Yoder, 2013). However, although a number of valid and reliable work environment survey instruments existed, they specifically were tailored to the hospital setting (Aiken & Patrician, 2000; Kramer & Hafner, 1989; Lake, 2002). A less well-known instrument, the Magnetic Resources Inventory (MRI), was found to measure critical work environment characteristics in broader organizational terms (W. Jones, personal communication, March 8, 2010). Psychometric testing based on one prior study of PHNs demonstrated that the MRI was suitable for this purpose. However, further adaptation was deemed necessary to

specifically tailor items to the population-focused public health setting. This issue will be further discussed.

According to Aiken and Patrician (2000), nursing work environment research should be designed to tie measures of organizational quality to relevant patient and/or workforce outcomes. Job satisfaction, organizational commitment, and intent to stay were chosen as outcome measures for this study because they were shown to have a significant relationship to work environment quality, as well as to nursing job vacancy and turnover rates (Blegen, 1993; Coomber & Bariball, 2007; Gregory et al., 2007; Hayes et al., 2006; Leveck and Jones, 1996).

Job satisfaction was measured with a valid and reliable instrument designed for use in multiple settings (Hoppock, 1935; McNichols, Stahl, & Manley, 1978; Yoder, 1995). Organizational commitment was measured with an instrument developed in conjunction with the MRI (W. Jones, personal communication, March 8, 2010). The intent to stay scale was developed for use in this study, with the design based on instruments used in prior research (Ingersoll et al., 2002; Price & Kim, 1993).

SAMPLE

The sample potentially consisted of all nurses working in public health agencies at the state, regional, and local level in Texas. According to a recent PHN enumeration study by the Department of State Health Services (DSHS), approximately 1,000 nurses were estimated to work in 65 full-service local health departments (LHDs), four DSHS central office divisions, and the eight DSHS service regions in Texas. Approximately two-thirds (63%) of nursing positions were held by Registered Nurses (RNs), with Licensed Vocational Nurses (LVNs) representing the next largest group (32%). Only a small

percentage of PHNs (4%) worked as Advanced Practice RNs (APRNs). Other demographic data were not available from that study (DSHS, 2013).

The Principal Investigator (PI) met with state and local public health agency administrators/directors to explain the purpose of the survey. Letters of agreement were obtained from the DSHS central office and regional service areas and from 19 of the 65 LHDs in Texas. Each of these agencies provided the names and email addresses of the PHNs they employed.

INCLUSION AND EXCLUSION CRITERIA

Little is known about the job functions or roles of nurses in public health agencies in Texas. Therefore, the inclusion criteria included LVNs, RNs, and APRNs working in any of the governmental public health agencies participating in this study regardless of the nurse's job classification/role. Such broad inclusion criteria were needed, due to the multidisciplinary nature of public health practice and the use of nurses in non-traditional roles (ASTDN, 2000, 2007; Hill et al., 2010). Exclusion criteria included public health professionals from other disciplines, as well as anyone not working in a participating governmental public health department in Texas.

DATA COLLECTION

The process to recruit individual public health agencies took approximately six months to complete. After contact information was received from participating public health agencies, email letters of invitation were sent to the PHNs they employed. These letters invited PHNs to participate in the survey. Participation was voluntary and PHNs were told that completion of the survey served as their informed consent. Each nurse was given a unique identifying number. This step was required to prevent the possibility of

duplicate entries by the same individual. An estimated timeframe for survey completion was provided. Those PHNs who chose to participate were directed to a secure web site where the online survey was administered. Each nurse received a survey link specifically designated for his/her email address. A minimum of two email reminders were sent to all non-respondents as recommended by Dillman, Smythe, & Christian (2009).

Survey instruments were entered into survey administration software on a secure online server. A pilot test was conducted with three individuals who served as subject matter experts in survey design, work environment research, and public health practice. Feedback was obtained regarding the survey format, time required to complete the survey, and any technical problems noted. The data collected through this process was transferred to SPSS software to identify any potential problems with respect to data analysis. No problems of this nature were found. Therefore, the final survey format was copied to a new location on the server before the instruments were made available to PHNs online.

INSTRUMENTS

Demographic Data Sheet

A data collection instrument was designed to obtain detailed demographic information about the PHNs participating in this survey. First, participants were asked questions about their public health agency employers, including agency type (i.e., DSHS or LHD), their agency's status with respect to the Public Health Accreditation Board (PHAB) accreditation, primary work setting (i.e., urban/suburban, rural, or a combination of settings), and whether or not a Chief Nursing Officer was employed by their agency. Next, PHNs were asked to provide information about their practice, including license type (i.e., LVN, RN, or APRN), professional certification, job role, licensure requirements for

their jobs, full-time versus part-time work status, and the public health program/service areas in which they worked. This was followed by a series of questions regarding age, race, ethnicity, gender, educational background, and years of experience in nursing, in public health, in the agency, and in the current job. (See Demographic Data Sheet in Appendix A.)

Public Health Magnetic Resource Inventory (PH-MRI)

The PH-MRI was adapted from the *Magnetic Resource Inventory (MRI)*. The MRI is a relatively new nursing work environment research instrument developed by the Mississippi Office of Nursing Workforce (MONW). The purpose of the MRI is to measure critical characteristics that suggest work environment quality. A comprehensive review of the literature served as the basis for MRI survey item generation. To obtain content validity, seven focus groups were convened by the MONW. These focus groups were comprised of a total of 170 nurses who worked in multiple settings and represented a variety of job roles; including education, direct care, and management. Through this process, a survey instrument was developed with a total of 60 items organized under the following subscale titles: job meaning, fun, involvement, workload, learning and growing, rewards and recognition, work relationships, organizational practices, customer service, leadership/self-management, and leadership/interpersonal habits. That instrument was pilot tested and subsequently was used to survey nurses in hospital, long-term care, and public health settings (W. Jones, personal communication, March 8, 2010).

To determine suitability for use in researching the PHN work environment in Texas, preliminary psychometric testing was performed on the 60-item MRI. Institutional Review Board approval for that psychometric study was obtained from the University of Texas at Austin. Data previously collected during a survey of PHNs in Mississippi in 2008 were

used for this purpose. Out of a total of 419 PHNs, 229 completed the survey, representing a response rate of 55%. (See Table 1 below.) In most respects, demographic data from

Demographic Characteristic	Attributes Measured	n	%
Job Title	Administrator	39	17%
	Advanced Practice Nurse	21	9%
	PHN	155	68%
	Other	12	6%
Highest Education	Diploma or Associate Degree	156	68%
	Bachelor's Degree	55	24%
	Master's Degree or Higher	15	6.5%
Gender	Female	220	97%
	Male	7	3%
Ethnicity	Other	31	14%
	White	196	86%
Age	< 30 years old	12	5%
	30 – 39 years old	29	13%
	40 -49 years old	60	26%
	50 - 59 years old	107	47%
	≥ 60 years old	21	9%
Years in the Job	≤ 2 years	43	19%
	2-10 years	75	33%
	11-20 years	54	23.5%
	> 20 years	54	23.5%
Years as a Nurse	≤ 2 years	4	2%
	2-10 years	28	12%
	11-20 years	53	23%
	≥20 years	143	62%

Table 1: Demographic Data from PHN Pilot Study (n = 229)

this sample were similar to those of PHNs in the U.S. as a whole. However, the percentage of PHNs with a BSN or higher degree was closer to the regional than the national average (University of Michigan, 2013)

Data from that pilot study were used to perform exploratory factor/principal components analysis with Varimax rotation. Eigenvalues > 1.00 were selected for extraction. The minimum item loading was established at 0.40 (Field, 2005, 2013). This initially resulted in an unforced ten factor solution. However, three subscales contained fewer than three items per subscale as recommended by Nunnally and Bernstein (1994). One item pertaining to shift work was removed because it fell below the minimum value established for item loading.

Several forced factor solutions were evaluated with the remaining items. Ultimately, a six factor solution was found to produce a logical set of items within subscales with 70 percent of variance explained. Subscales were labeled as follows: management support, professional growth, staffing, autonomy, teamwork, and service excellence. Cronbach's alpha (α) internal consistency reliability for the 60-item MRI was found to be high ($\alpha = .98$).

Scale reliability statistics were further analyzed to refine the instrument and ensure that all factors/subscales were internally consistent (DeVillis, 2003). Final determinations regarding item inclusion or removal were made in consultation with public health, psychometric testing, and nursing work environment subject matter experts convened to assist in this analysis. Decisions were made by consensus based on findings regarding reliability, parsimony, communalities above .50, and percentage of variance explained (Field, 2005, 2013; Matsunaga, 2009; MacCallum, Widaman, Preacher, & Hong, 2001; Holyk, 2013; Munro, 2005).

Ultimately, 22 items were removed and 37 items were retained. Repeat factor analysis demonstrated that the subscale structure remained unchanged after this revision. Reliability analysis demonstrated that Cronbach's alpha remained high ($\alpha = .96$) for the 37-item revised MRI survey instrument. Furthermore, Cronbach's alpha for all subscales was acceptable to high (α ranged from .78 to .92) (Nunnally & Bernstein, 1994). (See Table 2 on page 70.)

Total score analysis was performed to determine how well the MRI performed in terms of providing meaningful information for decision-making purposes. Table 3 on page 71 provides data regarding measures of central tendency, which are reported as Likert scale scores. All mean scores were found to fall within the neutral range, which was of concern to work environment and psychometric testing subject matter experts. However, this finding was thought to be an artifact of the 5-point Likert scale response set used in the pilot study (i.e., 1 = very untrue, 2 = untrue, 3 = neutral, 4 = true, 5 = very true).

Public health subject matter experts were convened to adapt the 37-item MRI to the public health setting. First, items were evaluated to establish content validity. For the most part, the wording of the original items was maintained. However, four items were revised to reflect the population-based public health setting. A total of 16 additional items were generated, including an entirely new subscale to evaluate the public health practice model. These decisions were based on subject matter expert opinion and a review of the PHN and

Subscale	Load	Subscale	Load	Subscale	Load
Management Support (α = .96)		**Professional Growth** (α = .87)		**Teamwork** (α = .90)	
• Positive environment	.89	• Orientation	.61	• Laughter	.74
• Communication	.87	• Recognition	.61	• Work together	.73
• Conflict resolution	.82	• Training on "people side"	.60	• Communication	.65
• Prioritization	.82	• Big picture	.57	• Stress relief (humor)	.57
• Managing change	.79	• Competitive pay (external)	.55	**Service Excellence** (α = .85)	
• Coaching	.79	• Technical training	.53	• Service Delivery	.74
• Collaboration	.78	• Competitive pay (internal)	.51	• Customer Service	.71
• Giving praise	.76	• Career advancement	.51	• Working with external partners	.69
• Problem correction	.76	**Staffing** (α = .85)			
• Performance appraisal	.76	• Day-to-day staffing	.80		
Autonomy (α = .88)		• Manageable workload	.73		
• Having authority	.71	• Fair work distribution	.61		
• Skills fully used	.72	• Scheduling flexibility	.59		
• Making a difference	.72	• Getting timely information	.52		
• Ideas implemented	.61	• Qualified people	.51		
• Ideas encouraged	.60				
• Time with customers	.56				
Total PH-MRI Scale (α = .97)					

Table 2: Factor Analysis and Reliability Testing of the 37-item MRI (*n* = 229)

Component (Subscale)	*n*	Min	Max	Range	Mean	Median	Mode	SD
Management Support	213	1.30	5.00	3.70	3.74	3.90	5.00	1.02
Professional Growth	219	1.13	5.00	3.88	3.03	3.13	3.38	0.83
Autonomy	214	1.17	5.00	3.83	3.60	3.67	3.83	0.84
Staffing	214	1.33	5.00	3.67	3.18	3.33	3.33	0.88
Teamwork	219	1.00	5.00	4.00	3.71	4.00	4.00	0.99
Service Excellence	214	1.00	5.00	4.00	3.82	4.00	4.00	0.95
Total MRI Instrument	177	1.62	4.97	3.35	3.47	3.49	3.57	0.78

Table 3: Measures of Central Tendency for the 37-item MRI (n = 299) (Mean Scale and Subscale Scores)

hospital nursing work environment research literature (Aiken & Patrician, 2000; Dingley & Yoder, 2013; Kramer & Schmalenberg, 2004a; Lake, 2002; Porter O'Grady, 1992, 2009; Porter O'Grady & Finnigan, 1984). This process resulted in the revised 53-item *Public Health Magnetic Resource Inventory (PH-MRI),* which was used to measure characteristics of the work environment in the survey of PHNs in Texas. Based on findings from the pilot study, the response set for the 53-item PH-MRI was changed to a 4-point Likert-type scale that did not include a neutral option (i.e., 1 = very untrue, 2 = untrue, 3 = true, 4 = very true). Such forced-choice response sets have been found to provide better management data for decision-making purposes (Losby & Wetmore, 2012).

Hoppock's Job Satisfaction Scale (HJSS)

The HJSS is a well-established survey instrument designed to assess employees' overall satisfaction with their jobs (Hoppock, 1935). It is a simple questionnaire comprised of four items that measure the following attributes of job satisfaction: how much of the time employees feel satisfied, how well employees like their jobs, how much interest employees have in changing their jobs, and how closely employees' perceive their level of satisfaction to be similar to that of their peers. The response set for the HJSS consists of seven individually worded responses for each item. Item responses are then scored on a scale ranging from one to seven. The total job satisfaction score represents a summary of scores to all items.

McNichols et al. (1978) conducted psychometric testing of HJHS. Principal component analysis demonstrated high loadings (i.e., .65 to .92) under one principal component, with 72 percent of the total variance explained. Acceptable to high internal consistency reliability was found for the scale, with Cronbach's α found to be acceptable to high (i.e., α ranging from .76 to .89) in four participant samples. In a subsequent study by Yoder (1993, 1995), Cronbach's α of the HJHS was found to be satisfactory (α = .87).

Subject matter experts for this PHN study reviewed the HJSS and determined that all items met standards for content validity. However, within two of the survey items, one individually worded response was thought to be confusing. Based on a 100% consensus, subject matter experts determined that both of these responses should be removed (See the revised HJSS in Appendix A).

MRI Organizational Commitment Scale (MRI-OC)

The MRI-OC was developed by the MONW to measure the extent to which employees feel committed to their healthcare organizations, as well as the extent to which burnout or other commitment-related concerns were experienced. The MRI-OC was developed and pilot tested in conjunction with the MRI (W. Jones, personal communication, March 8, 2010). Preliminary psychometric testing of the MRI-OC was performed using these pilot study data.

The MRI-OC originally contained 10 items, which were measured using a 5-point Likert scale response set (i.e., 1 = very untrue, 2 = untrue, 3 = neutral, 4 = true, and 5 = very true). Exploratory factor analysis was performed using principal component analysis with Varimax rotation. This resulted in an unforced 2 component solution with 69% of the variance explained. All items loaded logically under two components/ subscales, which were labeled commitment and concerns. Reliability was found to be high for the scale and subscales of the MRI-OC (> .80) (See Table 4 on page 74).

Total score analysis was performed to determine how well the MRI-OC performed in providing meaningful information for decision-making purposes. Table 5 on page 75 provides data regarding measures of central tendency, which are reported as Likert scale scores. The mean scores for the commitment subscale were M = 3.79 and for the total

Subscale	Loading		Subscale	Loading
Commitment (α = .87)			**Concerns** (α = .77)	
• Job worth it	.89		• Find other job	.83
• Encourage others to work	.86		• Stay for benefits	.82
• Say positive things	.82		• Feel burned out	.80
• Recommend care	.87		• Work stressful	.79
• Encourage others to work	.86		• Manager's attitude	.78
			• Feel withdrawn	.76
Total Scale (α = .87)				

Table 4: Factor Analysis and Reliability Testing of the 10-item MRI-OC (*n* = 229)

instrument M = 3.92, fell within the neutral range. As with the MRI, subject matter experts believed these findings may have been due to the Likert scale response set that was used. Public health subject matter experts were convened to review the MRI-OC to determine content validity and determine whether further adaptation was needed. One item in the commitment subscale was considered to be hospital or clinic-oriented, rather than population-focused. Two items in the concerns subscale were considered relevant but were already measured by other instruments used in this PHN study. Therefore, these two items were removed. Based on the organizational commitment and PHN work environment research literature, items were added to measure overall commitment to the organization, as well as concerns regarding safety, budget, and bureaucracy (Allen & Meyer, 1990; Dingley & Yoder, 2013). These decisions were made with 100% consensus of subject matter experts. This resulted in a revised 11-item MRI-OC. As with the PH-MRI, the response set for the MRI-OC was changed from a 5- point to a 4-point Likert-type scale.

Component (Subscale)	*n*	Min	Max	Range	Mean	Median	Mode	SD
Commitment	221	1.00	5.00	4.00	3.79	4.00	4.00	0.98
Concerns	227	1.00	5.00	4.00	1.98	1.83	1.00	0.88
Total MRI-OC*	220	1.30	5.00	3.70	3.92	4.00	5.00	0.76

* Concerns scale reverse coded prior to calculating the total score

Table 5: Measures of Central Tendency for the 10-item MRI-OC (*n* = 229)

Public Health Intent to Stay (PH-ITS) Scale

The PH-ITS scale was specifically developed for this PHN survey. Items were designed to obtain PHNs' perceptions regarding their thoughts about leaving, their intent to stay for at least one year, their intent to stay five years or more, and their intent to stay as long as possible. Specific item content was based on findings reported in the nursing, military, and hospital intent to stay research literature (Ingersoll et al., 2002; Gurney, 1990; Kim, Price, Mueller, & Watson, 1996; Price & Mueller, 1981, 1986a; Yoder, 1995).

Gurney (1990) designed a survey instrument to study determinants of the intent to stay of nurses with doctoral degrees. Items measured intent to quit, intent to stay unless something better came along, and intent to stay until retirement. The likelihood of working for the organization for at least one year also was measured. Factor analysis of Gurney's instrument revealed a single scale and a high degree of internal consistency reliability (α = .89). In a study of military nurses, Yoder (1992, 1995) used five items suggested by Price to measure intent to stay. One item measured intent to quit, with the remaining questions measuring reluctance to leave, contentment to stay, and plans to stay as long as possible. This instrument included a question regarding the length of time the nurse planned to stay in the military. Factor analysis was not reported. However, internal consistency reliability was reported to be high (α = .94).

In a study of medical personnel in a military hospital, Price and Kim (1992) used a 4-item instrument to measure intent to stay. Items measured intent to quit, reluctance to leave, no plans to leave voluntarily, and intent to stay as long as possible. However, no data were reported regarding factor analysis or reliability testing. In a large study of registered nurses in the northeastern region of the US, Ingersoll and colleagues (2002) used a 4-item instrument to measure intent to stay. Two questions measured intent to leave (i.e., temporarily or permanently) and two questions measured intent to stay for at least a specific time frame (i.e., one or five years). Neither factor structure nor reliability testing was reported for that instrument.

The items included in the PH-ITS scale incorporated many of the concepts from instruments developed by Price and Kim (1992) and Ingersoll et al. (2002). The choice to incorporate time frames was made based on the recommendation of public health subject matter experts. Specific time frames during which PHNs intended to stay (i.e., one year,

five years, or as long as possible) were considered important when planning to address future turnover. As with the PH-MRI and MRI-OC, the response set for the PH-ITS scale was a 4-point Likert-type response set (i.e., 1 = very untrue, 2 = untrue, 3 = true, 4 = very true) (See Appendix A.)

Power Analysis

Power is defined as the ability to detect statistically significant differences in the data when they exist. This is determined by the sample size, the significance level (α), and the magnitude of the effect (i.e., effect size) on the phenomenon of interest (Cohen, 1992; Kelley & Preacher, 2012; University of Wisconsin, 2016). An a priori calculation of minimum sample size for multiple regression was calculated in G*Power 3.1 software (Universität Düsseldorf. 2016). As recommended by Cohen (1992), the significance level for this PHN study was set at .05, the power level was set at .80, and the effect size was set at .15 (i.e., a medium effect).

Based on the middle range theory for this PHN study, total scores for the PH-MRI (work environment), the HJSS (job satisfaction), and the MRI-OC (organizational commitment) survey instruments were entered into G*Power as tested predictors of intent to stay. Furthermore, two demographic variables (agency type and nursing license type) were entered as untested predictors (Faul, Erdfelder, Buchner, & Lang, 2009). The a priori estimation of the minimum sample size required to achieve statistical power for this study was calculated to be 77 participants.

Data Analysis

Most data were collected for this PHN study using survey administration software on a secure online server (SurveyMonkeyPlatinum). A total of 210 PHNs entered the

online system, which served as their consent to participate in the survey. However, only 208 of these individuals actually completed the survey instruments online. In addition, a total of 9 PHNs completed paper surveys. Their consent paperwork was received with their survey documents. Paper surveys were screened using the unique identifiers issued with survey invitations to ensure that they did not duplicate data received online. The data from paper surveys were entered into the online system to ensure a central repository for survey data, as well as a secure and fire safe data backup system. Manual survey entries were re-checked for data errors, with no errors found. De-identified data then were downloaded from the online server directly into SPSS Version 22.0 statistical software for analysis.

Further screening was used for de-identified data to look for patterns of missing data. This screening process was performed in two phases, with cases removed if more than 10% of data were missing. Demographic data were screened first, with 217 cases retained for demographic data analysis. Work environment and outcomes data were screened next, with 211 cases retained for this phase of analysis. Each time, Little's test was performed to ensure that the pattern of the remaining missing data was completely at random (Little, 1988).

Visual screening was performed through the use of appropriate options in SPSS (e.g., scatter plots, whisker plots, histograms, and normal distribution curves). A small number of extreme values were observed (Field, 2005, 2013; Hayes, 2013). However, these values were treated as valid data, due to the strict controls put in place for sample selection (i.e., participation by invitation only with unique identifiers assigned), pilot testing of the online survey, and re-verification of manually entered data from paper surveys.

Psychometric testing was performed using data collected with instruments used to measure the work environment and outcomes of job satisfaction, organizational commitment, and intent to stay. Exploratory factor analysis with Varimax rotation was performed using procedures prescribed by Field (2005; 2013). Subscale determinations were made based on procedures described by Nunnally and Bernstein (1993). Content and construct validity were determined using procedures described by DeVellis (2003). Item retention was based on minimum loadings of .04, minimum communalities of .50, reliability (α) if an item was deleted, and subject matter expertise regarding item priority (DeVellis, 2003; Field, 2013; MacCallum, Widaman, Preacher, & Hong, 2001). Cronbach's α internal consistency reliability was determined using procedures described by Field (2005: 2013).

Relationships between independent and dependent variables were explored first through the use of Pearson's *r* bivariate correlations. The strength of the correlation coefficient (*r*) was determined using Munro's criteria for evaluation (Munro, 2005). The effect size (r^2) was determined using procedures prescribed by Cohen (1992a, 1992b). After statistically significant correlations were established and deemed to be meaningful, inferential statistics were performed to identify causal relationships. Simple and hierarchical linear regression models were generated as prescribed by Field (2005; 2013). Mediation analysis was performed using the four-step method described by Miles and Shevlin (2001). Serial mediation was tested using Process software developed by Hayes (2013).

Protection of Human Subjects

Institutional Review Board (IRB) review for both the preliminary psychometric testing of survey instruments and the survey of PHNs in Texas was obtained from the University of Texas at Austin. In order to survey state PHNs, an IRB review also was obtained from the Texas Department of State Health Services (DSHS). In each case, IRB exempt status was assigned to the studies.

Chapter Summary

This chapter provided a description of the methodology used for this study. A prospective, cross-sectional survey design was used to determine the relationships between the public health nursing work environment and three critical work environment outcomes: job satisfaction, organizational commitment, and intent to stay. The survey sample consisted of 217 PHNs working at the state, regional, or local level in Texas.

The method for sample selection was discussed, as well as inclusion and exclusion criteria. The online survey design was described, including informed consent and procedures for assuring the accuracy of data. Survey instrument design and/or selection methods were discussed, including validity, reliability, and psychometric testing of two instruments used in a previous study of PHNs. Procedures for data analyses also were discussed. Findings will be presented in Chapter 4.

CHAPTER 4: FINDINGS

This chapter describes the quantitative results of this cross-sectional descriptive study. The study was designed to explore relationships between nurses' perceptions regarding the public health work environment and three related work environment outcomes: organizational commitment, job satisfaction, and intent to stay. The study was primarily conducted as an online survey. However, the opportunity for completion of paper copies of the survey was provided as an option. Data were analyzed using SPSS version 22.0 (IBM, 2013) and GPower 3.01 (Faul, Erdfelder, Buchner, & Lang, 2009).

This chapter is comprised of three sections. The first section provides a description of the survey setting and demographic characteristics of the sample of public health nurses (PHNs). The second section examines findings as they relate to the research questions posed for the study. The third section provides an overview of findings as they relate to the research model, as well as a post-hoc power analysis to assess generalizability of findings to the population of PHNs as a whole. A chapter summary is provided at the end.

Setting and Sample

According to recent studies by the Department of State Health Services (DSHS), approximately 1,000 nurses were estimated to work in 65 full-service local health departments (LHDs), four DSHS central office divisions, and eight DSHS public health service regions in Texas (DSHS, 2008a, 2008b, 2009, 2013a). Registered Nurses (RNs) were reported to hold approximately two-thirds (63%) of nursing positions, with Licensed Vocational Nurses (LVNs) representing the next largest group (32%). Only a small proportion of PHNs (~4%) worked as Advanced Practice RNs (APRNs). The highest vacancy rates were reported for APRN positions in LHDs (25%) and for RN positions in

the eight regional service areas of the DSHS (21%). Significantly higher vacancy and turnover rates also were reported for nursing positions in border areas of the state (DSHS, 2013a).

No data base or central point of contact was identified for all practicing PHNs in Texas. Data collected by the Texas Board of Nursing (BON) did not distinguish between public health and other community health employers (Texas BON, n.d.). Contact information also was not available through public health nonprofit professional organizations in Texas (personal communications, T. Pali, Executive Director of the Texas Public Health Association, and J. Smith, Director of Public Health, Texas Association of Local Health Officials, September 25, 2012). Therefore, the best way to recruit nurses for this study was through their public health agency employers.

The Principal Investigator (PI) for this study contacted public health agency directors/administrators to request their assistance. Ultimately, the PI received letters of agreement from the DSHS central office, all DSHS regional service areas, and 19 LHDs across the state. Based on contact information provided by these participating public health agencies, email letters of invitation were sent to 404 nurses. A total of 219 nurses agreed to participate in the survey. However, 217 completed surveys were received (response rate 54%). Of this number, nine paper copies were returned by mail and 208 surveys were submitted online. Paper surveys were manually entered into the online survey administration system (SurveyMonkey Platinum).

A complete file of de-identified survey data was then downloaded into SPSS 22.0 statistical software for analyses. An inspection was performed to identify potential problems with missing data. Only 12 (5.53%) respondents (or cases) were found to have data missing for any of the demographic variables measured. In total, less than 1% of

values were missing. Given this low percentage of missing data, the decision was made to not eliminate cases from the analysis of findings regarding the demographic characteristics of the survey sample. Therefore, demographic data from all 217 completed surveys were analyzed using descriptive statistics (i.e., frequencies and measures of central tendency), as well as inferential statistics. The following is a summary of the findings.

PUBLIC HEALTH AGENCY CHARACTERISTICS

Survey respondents reported agency type as either DSHS (46.5%, *n* = 101) or one of 19 participating LHDs (53.5%, *n* = 116). Most respondents were RNs (74%, *n* = 161). LVNs were the next largest group (18%, *n* = 39), with the rest (8%, *n* = 17) being APRNs. However, most LVNs (*n* = 32) and APRNs (*n* = 14) worked for LHDs. More RNs in the sample worked for DSHS (*n* = 91) than for LHDs (*n* = 70). Most PHNs (52.1%, *n* = 113) reported their primary work setting to be a combination of urban/suburban and rural. The remainder reported working in a setting that was only rural (24.9%, *n* = 54) or only urban/suburban (23.0%, *n* = 50). There was little if any correlation between primary setting and public health agency type (*r* = .18, *p* = .00)

Participants were asked to report the accreditation status of their public health agency employer. Approximately one third of respondents (33.2%, *n* = 72) reported their agency either currently was seeking or planned to seek accreditation by the national Public Health Accreditation Board (PHAB). On the other hand, 4.1% (*n* = 9) of respondents reported their public health agency did not plan to seek accreditation. However, the majority (51.6%, *n* = 112) of respondents indicated that their agency's plans regarding accreditation were unknown (See Table 6 on page 84).

It is interesting to note that 11% of respondents (n = 24) reported their public health agency had already been accredited. This is in contrast to information available on the

Public Health Accreditation Board (PHAB) web site, which indicated that no public health agencies in Texas were accredited at the time the PHN survey was administered. Several agencies were reported to have been enrolled in the process and may have received accreditation since that time (PHAB, 2014).

Approximately half of PHN survey respondents (54%, n = 117) reported that their public health agency employed a Chief Nursing Officer (CNO). Conversely, 38% (*n* = 83) reported their agency did not employ a CNO. A small percentage of respondents (7%, *n* = 16) were uncertain about this issue (See Table 6 below).

Agency Characteristic	Attributes Measured	n	LVN	RN	APRN	% of Total
Agency Type	State Agency	101	7	91	3	46.5%
	Local Agency	116	32	70	14	53.5%
Primary Work Setting	Urban/Suburban	50	14	30	6	23.0%
	Rural	54	5	46	3	24.9%
	Combination	113	20	85	8	52.1%
Accreditation Status	Currently Accredited	24	8	16	0	11.1%
	Planning or Seeking	72	18	45	9	33.2%
	Not Planning	9	0	6	3	4.2%
	Unknown	112	13	94	5	51.6%
Chief Nursing Officer	Yes	117	31	75	11	53.9%
	No	83	5	73	5	38.2%
	Don't Know	16	3	12	1	7.4%
	Missing Values	1	0	1	0	0.5%

Table 6: Public Health Agency Characteristics in Texas (n = 217)

PROFESSIONAL CHARACTERISTICS OF NURSES

Only 2.7% (*n* = 6) of the PHNs in this study stated they worked part-time. The majority (97%, *n* = 156) reported working full-time. Few PHNs (8%, *n* = 18) reported acquiring either a basic or an advanced certification in nursing or public health. Of the

LVNs, 87.2% (n = 34) reported vocational degree in nursing as their highest education. Four LVNs (10.3%) held associate degrees and one (2.6%) having a bachelor's degree. Among surveyed RNs (including APRNs), approximately 65% *(n* = 117) reported their highest education as a baccalaureate or higher degree in nursing or a related field. The remainder (n = 64) held associate degrees or diplomas. Few PHNs (*n* = 18) in the study reported having a professional certification in public health (See Table 7 below).

Professional Characteristic	Attributes Measured	n	LVN	RN	APRN	% of Total
Highest Education	Vocational Degree in Nursing	34	34	0	0	15.7%
	Diploma/Associate Degree in Nursing	64	4	57	3	29.5%
	Baccalaureate Degree	78	1	73	4	35.9%
	Master's Degree	35	0	25	10	16.1%
	Doctorate	4	0	4	0	1.8%
	Missing Values	2	0	2	0	1.0%
Certification	Yes	18	3	13	2	8.3%
	No	199	36	148	15	91.7%
Work Status	Full Time	210	38	156	16	96.8%
	Part Time/Other	6	1	4	1	2.7%
	Missing Values	1	0	1	0	0.5%

Table 7: Education, Certification, and Work Status of Texas PHNs (n = 217)

Approximately 40% of the PHNs in this study (41.9%, n = 91) reported *clinical service provider* as their primary job role. The remainder worked as *managers/ supervisors* (18.4%, n = 40), *public health generalists* (13.8%, n = 30), *program specialists* (13.8%, n = 30), *directors/ administrators* (4.1%, n = 9), or *other* (7.4%, n = 18). The majority of the directors/administrators (n = 8), managers/supervisors (n = 25), and clinical service providers (n = 60) worked for LHDs. The majority of program specialists (n = 23) and

those reporting other job roles (n = 13) worked for the DSHS. Public health generalists were evenly split between agencies. Most respondents (89%) reported that a nursing license was required for their jobs (See Table 8 below).

Job Characteristic	Attributes Measured	n	LVN	RN	APRN	% of Total
Job Role	Director/Administrator	9	0	7	2	4.1%
	Manager/Supervisor	40	3	33	4	18.4%
	Program Specialist	30	2	26	2	13.8%
	Public Health Generalist	30	3	27	0	13.8%
	Clinical Service Provider	91	29	53	9	41.9%
	Other Job Role	16	1	15	0	7.4%
	Missing Values	1	1	0	0	0.5%
License Requirement	License Recommended	7	2	5	0	3.2%
	License Required	194	33	146	15	89.4%
	Not Recommended/ Required	16	4	10	2	7.4%
	Missing Values	1	0	0	1	0.5%

Table 8: Job Roles and License Requirements of Texas PHNs (n = 217)

Of the LVNs in this study, most (74.4%, *n* = 29) worked as *clinical service providers*. However, three (7.7%) reported *manager/supervisor* as their primary role (See Table 8 above). However, nothing is known regarding the nature of the programs/services managed or licensure requirements for the LVNs' immediate supervisors or staff. Therefore, further study is needed to determine whether LVN scope and standards of practice issues would need to be addressed (Texas BON, 2013).

Job Characteristic	Attributes Measured	n	% of Total
Program/Service Areas (check all that apply)	Administration	65	30.0%
	Behavioral/Mental Health	11	5.1%
	Case Management/Care Coordination	81	37.3%
	Child Health	65	30.0%
	Chronic Disease Prevention/Control	46	21.2%
	Communicable Disease/Epidemiology	124	57.1%
	Community Organizing/Coalition Building	52	24.0%
	Disaster Preparedness/Response	88	40.6%
	Environmental Health	21	9.7%
	Family Planning/Women's Health	33	15.2%
	Health Education/Promotion	114	52.5%
	Health Inspection/Enforcement	29	13.4%
	Health Screening/Referral	64	20.5%
	Health Systems Planning/Policy	18	8.3%
	Immunization	132	60.8%
	Maternal Health	25	11.5%
	Nutrition	15	6.9%
	Primary/Ambulatory Care	22	10.1%
	Workforce Training	16	7.4%
	Other	33	15.2%

Table 9: Program Service Areas Worked by Texas PHNs (n = 217)

The PHNs in this study were asked to indicate the program/service areas where they worked routinely. Nearly half of the LVNs (46.2%, *n* = 18) reported working in a single program/service area. Approximately 20% of RNs (20.5%, *n* = 33) and 10% of APRNs (11.8%, *n* = 2) reported a single program or service focus. The remaining PHNs (75.6%, *n* = 158) reported routinely working in two or more areas, with four being the median

number of programs/services listed. Areas in which PHNs most often worked were as follows: *immunizations* (60.8%, *n* = 132), *communicable disease/epidemiology* (57.1%, *n* = 124), *health education/promotion* (52.5%, *n* = 114), *disaster preparedness/response (40.6%, n = 88)*, *case management/care coordination* (33.7%, *n* = 81), *child health* (30.0%, *n* = 65), and *administration* (30.0%, *n* = 65) (See Table 9 on page 87).

PERSONAL CHARACTERISTICS OF NURSES

The mean age of PHNs in the survey sample was 53 years. Only 4.6% of PHNs (*n* = 10) were under age 30. In contrast, 42% (*n* = 91) were between the ages of 51 and 60, while 17.5% (*n* = 38) were above age 60. Most respondents were female (89%, *n* = 193), White (86%, *n* = 186), and not of Hispanic/Latino ethnicity (83%, *n* = 179) (See Table 10 on page 89). Black/African American race (9%, *n* = 20) and Hispanic/Latino ethnicity (15%, *n* = 33) were underrepresented when compared to the population of Texas as a whole (United States Census Bureau, 2014). Nearly all the PHNs (92.2%, *n* = 193) completing the survey had more than 5 years of nursing experience. However, only two thirds (67.3%, n = 140) worked in public health for that period of time. Approximately half (45.2%, *n* = 98) of the PHNs worked for five years or less with their current employer. More than half of the PHNs (58.5%, *n* = 127) had worked in their current jobs over the last five years in the last five years (See Table 11 on page 90) There was a high correlation between nurses' age and experience in nursing (*r* = .74, p = .01), but a low correlation between age and years of experience in public health *(r* = .49, p = .01). Furthermore, nearly one-third of the PHNs (32.7%, *n* = 69) reported less than 5 years in public health and less than 5 years in their current jobs.

Personal Characteristic	Attributes Measured	n	LVN	RN	APRN	% of Total
Age (Mean = 53)	≤ 30 Years	10	2	8	0	4.6%
	31 – 40 Years	30	5	23	2	13.8%
	41 – 50 Years	48	11	31	6	22.1%
	51 – 60 Years	91	15	69	7	42.0%
	> 60Years	38	6	30	2	17.5%
Gender	Female	183	35	146	2	84.3%
	Male	31	4	12	15	14.3%
	Missing Values	3	0	3	0	1.4%
Race	American Indian/Alaska Native	7	1	6	0	3.2%
	Black/African American	20	4	11	5	9.2%
	Caucasian/White	186	34	140	12	85.7%
	Other	4	0	4	0	1.9%
Hispanic/Latino Ethnicity	Yes	35	11	23	1	16.1%
	No	180	28	136	16	83.0%
	Missing Values	2	0	2	0	0.9%

Table 10: Personal Characteristics of Texas PHNs (n = 217)

SUMMARY OF DEMOGRAPHIC CHARACTERISTICS

In summary, the sample consisted of 217 PHNs working for local public health agencies (53%) or the state health department (47%) in Texas. The majority of respondents were RNs, with LVNs and APRNs representing the other license types. Most of the LVNs and APRNs in the sample worked for LHDs. Most PHNs worked in settings that were a combination of urban, suburban, and rural. Approximately half worked in agencies that employed a CNO. Most PHNs were female, White, and not of Hispanic/Latino ethnicity.

Work Experience Characteristic	Attributes Measured	n	LVN	RN	APRN	% of Total
Years in Public Health	0 - 5	71	13	54	4	32.7%
(Mean = 11.6 years)	6 - 10	41	6	30	5	18.9%
	11 - 15	38	8	28	2	17.5%
	16 - 20	33	7	26	3	16.6%
	> 20	35	5	23	3	14.3%
Years in Agency	0 - 5	98	16	75	7	45.2%
(Mean = 8.8 years)	6 - 10	40	5	29	6	18.4%
	11 - 15	37	9	27	1	17.1%
	16 - 20	24	5	17	2	11.1%
	> 20	18	4	13	1	8.3%
Years in Job	0 - 5	127	20	97	10	58.5%
(Mean = 6.3 years)	6 - 10	38	7	26	5	17.5%
	11 - 15	27	4	22	1	12.4%
	16 - 20	15	4	11	0	6.9%
	> 20	8	4	5	1	4.6%
Years in Nursing	0 - 5	18	1	16	0	7.8%
(Mean = 22.6 years)	6 - 10	26	7	17	2	12.0%
	11 - 15	24	4	19	4	12.4%
	16 - 20	38	9	26	1	16.6%
	> 20	106	18	83	10	51.2%

Table 11: Years of Work Experience of PHNs in Texas (n = 217)

Their average age was 53 years. Among the RNs, approximately two-thirds reported their educational preparation as a baccalaureate or higher degree.

The PHNs in this study reported a variety of job roles, including clinical service provider, public health generalist, program specialist, manager/supervisor, and director/administrator. The majority of PHNs indicated that a nursing license was required for their job. Of the LVN respondents, most worked as clinical service providers.

However, three reported manager/supervisor responsibilities. Further evaluation is required to determine if scope of practice issues could be of concern.

Research Questions

Survey data collected from the PHNs in Texas were further analyzed to answer each of the research questions posed for this study. These analyses were performed using the SPSS 22.0 statistical software package. A power analysis was conducted using G*Power 3.1 to ensure the size of the PHN sample was sufficient to ensure confidence in survey findings (Lu et al., 2013).

QUESTION 1: WHAT ARE THE PSYCHOMETRIC PROPERTIES OF SURVEY INSTRUMENTS?

Each of the survey instruments used in this study was reviewed by public health, nursing work environment, and psychometric testing subject matter experts. Survey items were developed, adapted, or removed as deemed appropriate. Content validity was established (See pages 67 through 78 in Chapter 3 regarding this process).

In this portion of the chapter, the focus is on findings regarding the psychometric properties of instruments as they were adapted and used in the PHN survey in Texas. However, before psychometric testing could be performed, it was important to evaluate patterns of missing data (Little, 1988; Pigott, 2001). Five cases were removed as a result of this process. For three removed cases, more than 10% of survey item responses were missing. For two removed cases, an entire outcome scale was missing. Little's test confirmed that missing data for the remaining cases were completely at random (X^2 = 4205.79, df = 4379, $p.$ = .97) (Little, 1988). Therefore, further psychometric testing was performed.

Public Health Magnetic Resource Inventory (PH-MRI)

For this survey of PHNs in Texas, adaptations were made to the 37-item Magnetic Resource Inventory (MRI). The response set was modified to remove the neutral option as recommended when survey findings are intended for decision-making purposes (Losby & Wetmore, 2012; Malhotra & Peterson, 2006). Where appropriate, item wording was modified to reflect population-focused public health practice. Furthermore, 16 new items were developed. One new subscale was created to measure PHNs' perceptions regarding organizational matters affecting public health practice. Proposed subscales were labeled as follows: management support, professional growth, autonomy, staffing, teamwork, practice model, and service excellence.

Principal components analysis. Exploratory principal components analysis with Varimax rotation was performed on the 53-item PH-MRI. All items loaded logically within eight subscales, with 70% of the total variance explained. All criteria were met for minimum item loading and communalities (Field, 2013; MacCallum, Widaman, Preacher, & Hong, 2001). However, the revised PH-MRI contained one subscale more than expected. Further analysis revealed that this was the result of one large subscale in the 37-item instrument being divided into two smaller subscales in the revised 53-item version. The eight PH-MRI subscales were labeled as follows: management support, career growth, training, autonomy, staffing, teamwork, practice model, and service excellence (See Figure 2 on page 93).

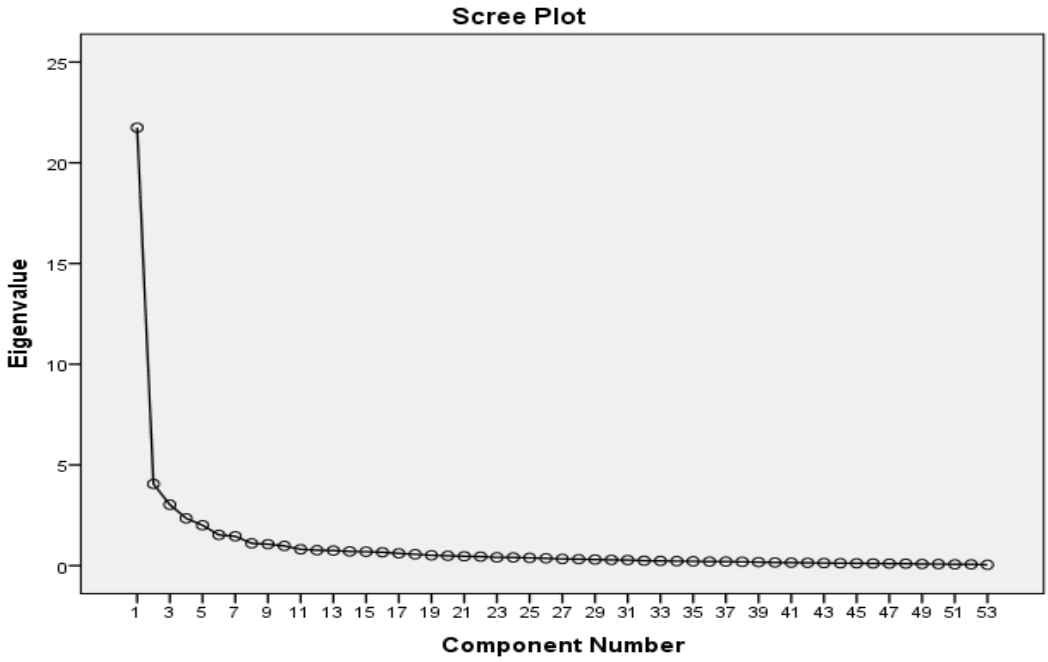

Figure 2: Scree Plot for the53-item PH-MRI (n = 211)

Reliability testing. Reliability testing was performed; Cronbach's alpha (α) reliability for the total PH-MRI instrument was found to be high (α = .97). All subscales also demonstrated a high degree of reliability (i.e., α between .85 and .96) (See Table 12 on page 94.)

Construct validity testing. To evaluate construct validity, bivariate correlations were calculated between PH-MRI subscales and the total score. Subscales demonstrated low to moderate correlations with one another. All subscales were highly correlated to the total PH-MRI score See Table 13 on page 95). Subject matter experts determined that the subscale structure was consistent with the middle range theory developed for this study. Therefore, construct validity was established (DeVellis, 2003; Munro, 2005; Rattray & Jones, 2007).

Subscale	Load	Subscale	Load	Subscale	Load
Management Support (α = .96)		**Training** (α = .85)		**Teamwork** (α = .94)	
• Communication	.85	• Technical training	.74	• Work together	.81
• Coaching	.82	• Orientation	.73	• Enjoy coworkers	.80
• Collaboration	.82	• Training on "people side"	.61	• Laughter	.80
• Conflict resolution	.81	• Continuing education	.56	• Communication	.78
• Giving praise	.81	**Autonomy** (α = .89)		• Stress relief (humor)	.76
• Positive environment	.80	• Freedom to network	.73	• Pitch in	.71
• Managing change	.80	• Making a difference	.70	• Respect	.67
• Focus on priorities	.80	• Ideas implemented	.67	• Welcome new staff	.64
• Performance appraisal	.70	• Having sufficient authority	.66	**Practice Model** (α = .92)	
• Problem correction	.70	• Skills fully used	.66	• Professional organizations	.72
Career Growth (α = .85)		• Ideas encouraged	.59	• Input to upper management	.72
• Competitive pay (internal)	.73	• Scheduling flexibility	.55	• Academic partnerships	.69
• Competitive pay (external)	.73	**Staffing** (α = .85)		• Big picture	.66
• Growth rewarded	.54	• Manageable workload	.77	• Decisions affecting practice	.60
• Longevity rewarded	.45	• Day-to-day staffing	.76	• Agency councils/ committees	.55
• Advancement opportunities	.44	• Disaster response staffing	.68	**Quality** (α = .85)	
• Support for college	.44	• Fair work distribution	.61	• Collaboration with partners	.79
• Meaningful recognition	.43	• Meeting priorities	.56	• Public health mission	.76
		• Getting timely information	.49	• Customer services	.70
				• Quality improvement	.69
Total PH-MRI Scale (α = .97)				• Qualified people	.51

Table 12: Factor Analysis and Reliability Testing of the 53-item PH-MRI (*n* = 211)

Subscale	Management Support	Career Growth	Training	Autonomy	Staffing	Teamwork	Practice Model	Service Excellence	Total PH-MRI
Management Support	1.00	.46**	.53**	.54**	.48**	.53**	.52**	.46**	.78**
Career Growth		1.00	.59**	.53**	.57**	.48**	.68**	.66**	.79**
Training			1.00	.53**	.58**	.51**	.63**	.62**	.75**
Autonomy				1.00	.50**	.63**	.62**	.57**	.78**
Staffing					1.00	.44**	.55**	.53**	.69**
Teamwork						1.00	.54**	.58**	.74**
Practice Model							1.00	.69**	.83**
Service Excellence								1.00	.79**
Total PH-MRI									1.00

**Correlation is significant at the 0.01 level (2-tailed)

Table 13: Bivariate Correlations between Subscales of the PH-MRI (n = 211)

Hoppock's Job Satisfaction Scale (HJSS)

The HJSS was developed to measure job satisfaction in any setting. In its original form, each item in the HJSS included seven potential responses that were specifically tailored to item content. Participants were asked to select only one item, with scoring based on the numerical value associated with the response provided. The item scores were then summed to obtain a total scale score. For this PHN study, subject matter experts considered two responses in the HJSS to be unclear.

These responses were eliminated, which resulted in two items with six, rather than seven, potential responses.

Principal components analysis. Exploratory principal component analysis with Varimax rotation was performed on the HJSS using the PHN survey data. This revealed a single 4-item scale with 70% of the variance explained (See Figure 3 on page 97). Item loadings and communalities fell above the required minimum levels (MacCallum et al., 2001; Nunnally & Bernstein, 1993). These findings are consistent with other studies that used the HJSS (McNichols et al., 1978; Yoder, 1992, 1995).

Reliability testing. Data from this PHN study were used to perform internal consistency reliability testing. Cronbach's alpha reliability was high ($\alpha = .85$). This finding is consistent with other studies using the HJSS (McNichols et al., 1978; Yoder, 1992, 1995) (See Table 14 on page 97).

Construct validity testing. The HJSS was chosen to serve as an empirical measure of job satisfaction in this study of PHNs. As indicated in Table 14 on page 97, the HJSS was found to reflect a single construct, with items highly statistically correlated to one another. This finding corresponded to findings in prior nursing job satisfaction research (McNichols et al., 1978). Subject matter experts determined these findings to indicate that construct validity of the HJSS was established within this study of PHNs (DeVellis, 2003).

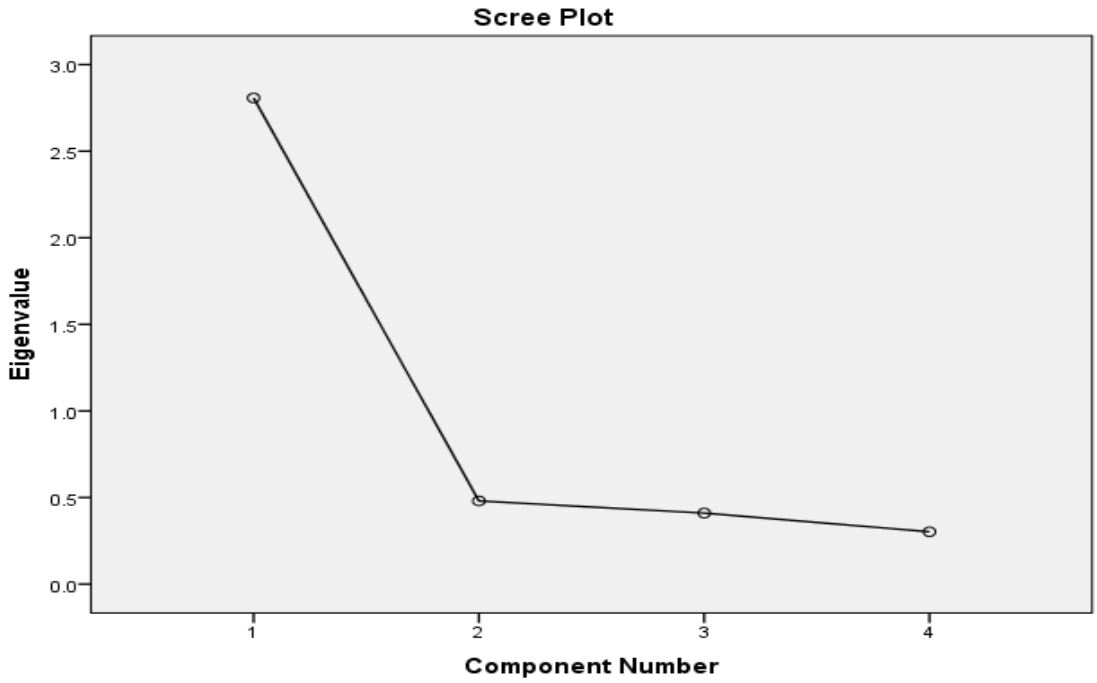

Figure 3 Scree Plot for the 4-item HJSS (*n* = 211)

Job Satisfaction Scale (α =.85)	**Loading**
• Satisfaction compared to others	.88
• Time satisfied	.84
• How well job liked	.83
• Changing jobs	.80

Table 14: Factor Analysis and Reliability Testing of the HJSS (*n* = 211)

Magnetic Resource Inventory Organizational Commitment Scale (MRI-OC)

For the survey of PHNs in Texas, adaptations were made to the 10-item Magnetic Resource Inventory Organizational Commitment Scale (MRI-OC). The response set used for the PH-MRI also was used for the MRI-OC. Two items were removed because they were redundant with items in other instruments used in the study. A third item was removed because it did not pertain to the population-focused practice of PHNs. Four new items were created based on subject matter recommendations; one was designed to measure overall commitment to the organization. The remaining items were designed to measure problems relating to safety, budget, and bureaucracy. Proposed subscales were labeled as follows: commitment and concerns.

Principal components analysis (PCA). After survey data were collected from the PHN study in Texas, exploratory principal component analysis was performed on the revised MRI-OC. This resulted in a forced 2-factor solution; however, only 57% of the total variance was explained. Four items were removed because their communalities fell below the minimum required value (i.e. < 5.0) (MacCallum et al., 2001). Three of the removed items, measuring safety, budget, and bureaucracy, had been newly developed for this study. The fourth removed item, measuring continuance commitment, had been included in the original MRI-OC.

Principal components analysis was repeated with the revised 7-item MRI-OC. The forced 2-factor solution resolved and 74% of the total variance was explained. Figure 4 on page 99 provides the scree plot resulting from the PCA of the instrument. Table 15 on page 99 provides details regarding the components/subscale structure.

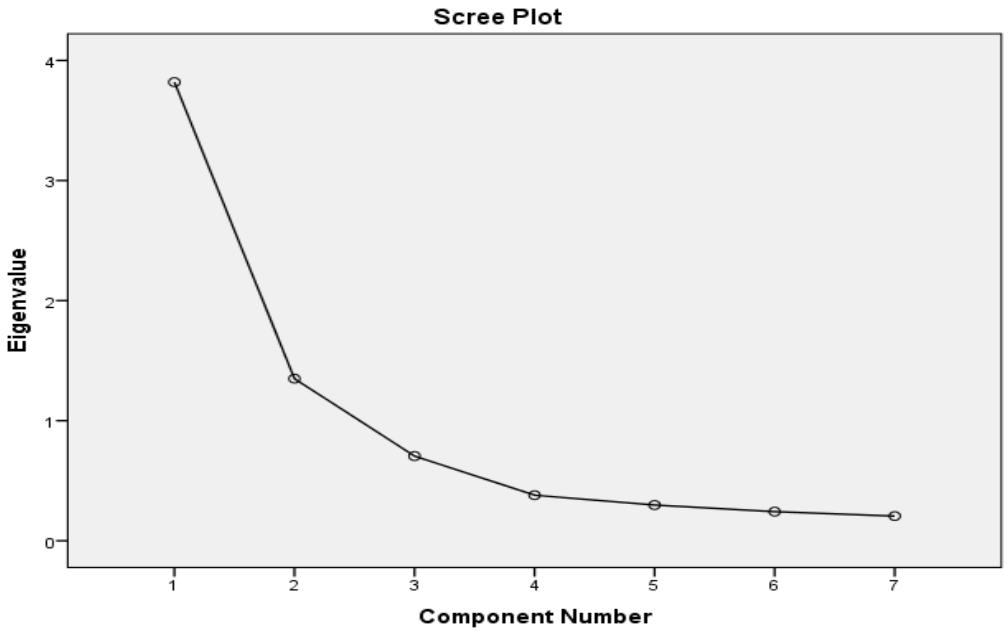

Figure 4 Scree Plot for the 7-item MRI-OC (n = 211)

Reliability testing. Internal consistency reliability testing was performed on the 7-item MRI-OC. Total scale reliability was high (α = .85) and subscale reliabilities were acceptable to high (i.e., α between .77 and .90) (See Table 15 below).

Subscale	Loading		Subscale	Loading
Commitment (α = .90)			**Concerns** (α = .89)	
• Say positive things	.88		• Feel burned out	.87
• Job worth it	.87		• Work stressful	.81
• Encourage others to work	.86		• Feel withdrawn	.73
• Feel strongly committed	.83		**Total Scale** (α = .85)	

Table 15: Factor Analysis and Reliability Testing of the MRI-OC (n = 211)

Construct validity testing. The revised 7-item MRI-OC served as an empirical measure of PHNs' organizational commitment. A low negative correlation was found

between MRI-OC subscales, indicating the concepts they measured were inversely related but distinct. Each of the subscales was highly correlated to the total score, indicating measurement of the same phenomenon (Munro, 2005; Rattray & Jones, 2007) (See Table 16 below). Items in the commitment subscale were designed to serve as measures of affective commitment (Allen & Meyer, 1990). Items in the concerns subscale were designed to measure burnout as a commitment-related concern (Maslach & Jackson, 1981). Subject matter experts believed the subscales appropriately measured latent variables related to organizational commitment. Therefore, construct validity was established for the MRI-OC (DeVellis, 2003; Munro, 2005; Rattray & Jones, 2007).

Subscale	Commitment	Concerns	MRI-OC
Commitment	1.00	-.44	.89**
Concerns		1.00	-.80**
MRI-OC			1.00

**Correlation is significant at the 0.01 level (2-tailed)

Table 16: Bivariate Correlations between Subscales of the MRI-OC (n = 211)

Public Health Intent to Stay Scale (PH-ITS)

The intent to stay scale used for this PHN study had not previously undergone psychometric testing. Five items were designed to measure employees' perceptions regarding their intent either to stay with or leave the organization. The 4-point Likert type scale used for the PH-MRI and MRI-OC also was used to measure responses to items in the PH-ITS.

Principal components analysis. Exploratory principal components analysis was performed using Varimax rotation. A single component scale resulted with 54% of the

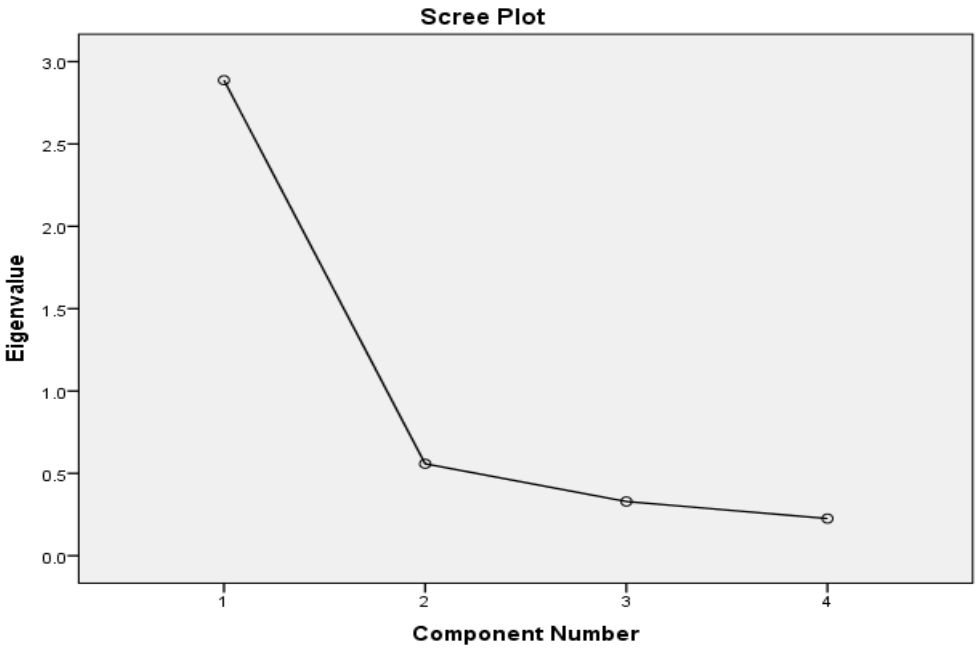

Figure 5 Scree Plot for the 4-item PH-ITS (*n* = 211)

Intent to Stay Scale (α =.87)	Loading
• Stay next five years	.92
• Stay as long as possible	.81
• Leave on a permanent basis	.83
• Stay at least one year	.79

Table 17: Factor Analysis and Reliability Testing of the PH-ITS (*n* = 211)

total variance explained. However, one item measuring intent to leave on a temporary basis did not meet minimum requirements for item loading or communalities; therefore, it was removed (See Table 17 on page 101). Principal components analysis was repeated for the 4-item PH-ITS. This resulted in a single component solution with 72% of the total variance explained. Figure 5 on page 101 provides a scree plot of this finding.

Reliability testing. Reliability testing was performed on the 4-item PH-ITS. Internal consistency reliability was found to be high ($\alpha = .85$) (See Table 17 on page 101).

Construct validity testing. In the middle range theory for this PHN study, intent to stay was identified as a critical work environment outcome. The PH-ITS scale was designed to serve as an empirical measure of PHNs' intent to stay with their public health employers. Items factored as a single construct, with high internal consistency reliability. Subject matter experts determined these findings to indicate that the scale measured a single construct. Therefore, construct validity was established for the PH-ITS (DeVellis, 2003).

Summary of Findings from Psychometric Testing

Psychometric testing revealed that each of the instruments used in this PHN study generally performed as expected. Each of the instruments was found to measure appropriate content domains. Content and construct validity were established. All instruments demonstrated high Cronbach's alpha internal consistency reliability, with subscale reliabilities being acceptable to high.

QUESTION 2: HOW DO PHNS PERCEIVE CHARACTERISTICS OF THEIR WORK ENVIRONMENTS?

Subscales of the PH-MRI measured the following critical process characteristics of the PHN work environment: management support, career growth, training, job autonomy, staffing, teamwork, practice model, and service excellence. A 4-point Likert-type response set was used to rate the extent to which characteristics of the work environment were perceived to be present or absent.

Measures of central tendency were calculated for the PH-MRI scale and subscales. Total scores provided information about the distribution of responses, as well as the contribution of each subscale to the total scale score. Through a combination of large scale size and positive distribution of PHN responses, the management support (M = 31.09, SD = 6.67), autonomy (M = 21.00, SD = 3.68), and teamwork (M = 24.87, SD = 4.16) subscales were found to represent approximately 50% of the total PH-MRI mean score (M = 152.89, SD = 24.35). Mode scores for the career growth (21.00) and practice model (16.00) subscales were higher than the means, which suggests that some agencies may do better in these areas than others (See Table 18 on page 104).

Mean scale and subscale scores were calculated. This demonstrated that PHNs generally perceived management support (M = 3.11, SD = 0.67), teamwork (M = 3.11, SD = 0.52), service excellence (M = 3.02, SD = .54), and autonomy (M = 3.00, SD = .53) to represent positive aspects of the work environment. On the other hand, career growth (M = 2.57, SD = .56), staffing (M = 2.60, SD = .64), practice model (M = 2.60, SD = .64), and training (M = 2.88, SD = 0.56) were not viewed as favorably. Therefore, further evaluation of these aspects of the work environment may be warranted (See Table 19 on page 104).

Item	# PHNs	# Items	Min	Max	Mean	Median	Mode	Range	SD
Management Support	198	10	10	40	31.09	30.00	30.00	30.00	6.67
Career Growth	198	7	7	28	18.40	18.00	21.00	21.00	3.91
Training	205	4	4	16	11.54	12.00	12.00	12.00	2.52
Staffing	203	6	7	24	16.46	17.00	18.00	17.00	3.10
Autonomy	202	7	9	28	21.00	21.00	21.00	19.00	3.68
Teamwork	204	8	10	32	24.87	24.00	24.00	22.00	4.16
Practice Model	198	6	6	24	15.61	16.00	18.00	18.00	3.84
Service Excellence	202	5	5	20	15.11	15.00	15.00	15.00	2.69
Total PH-MRI	160	53	90	212	152.89	153.00	142.00	90.00	24.35

Table 18: Measures of Central Tendency for the PH-MRI (Total Scores)

Item	# PHNs	Min	Max	Mean	Median	Mode	Range	SD
Management Support	198	1.00	4.00	3.11	3.00	3.00	3.00	0.67
Career Growth	198	1.00	4.00	2.59	2.57	3.00	3.00	0.56
Training	205	1.00	4.00	2.88	3.00	3.00	3.00	0.63
Staffing	203	1.00	4.00	2.74	2.83	3.00	2.83	0.52
Autonomy	202	1.00	4.00	3.00	3.00	3.00	2.71	0.53
Teamwork	204	1.00	4.00	3.11	3.00	3.00	2.75	0.52
Practice Model	198	1.00	4.00	2.61	2.67	3.00	3.00	0.64
Service Excellence	202	1.00	4.00	3.02	3.00	3.00	3.00	0.54
Total PH-MRI	160	1.00	4.00	2.89	2.68	2.89	2.30	0.46

Table 19: Measures of Central Tendency for the PH-MRI (Mean Scores)

Management Support

Public health nurses generally perceived their frontline managers to be supportive (M = 3.11, SD = 0.67). Highest mean scores were found with regard to a focus on priorities (M = 3.25, SD = 0.66), collaboration (M = 3.21, SD = 0.72), communication (M = 3.20, SD = 0.82), giving praise (M = 3.19, SD = 0.74), managing change (M = 3.19, SD = 0.77), a positive environment (M = 3.19, SD = 0.74), and conflict resolution (M = 3.11, SD = 0.80). Although positive, performance appraisal (M = 3.05, SD = 0.72) and problem correction (M = 3.03, SD = 0.77) fell only slightly above the minimum standard for "true (i.e., 3.00). In contrast, the mean score for coaching (M = 2.95, SD = 0.84) fell slightly below the minimum standard for "true" (See Table 20 on page 106).

Career Growth

Many PHNs perceived opportunities for career growth to be lacking within their public health agencies (M = 2.59, SD = 0.56). Perceptions regarding internal pay equity (M = 2.79, SD = 0.74), external pay equity (M = 2.51, SD = 0.86), growth rewarded (M = 2.46, SD = 0.75), longevity pay (M = 2.89, SD = 0.70), meaningful recognition (M = 2.47, SD = 0.78), opportunities for advancement (M = 2.46, SD = 0.75), and support for college (M = 2.57, SD = 0.82) indicate areas of concern. Mean scores for all items in this subscale fell below the minimum standard for "true" (See Table 21 on page 107).

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Communication	210	11	20	95	84	3.20	3.00	3.00	3.00	0.82
Coaching	210	13	41	100	56	2.95	3.00	3.00	3.00	0.84
Collaboration	210	5	22	106	77	3.21	3.00	3.00	3.00	0.72
Conflict resolution	209	9	29	102	69	3.11	3.00	3.00	3.00	0.80
Giving praise	210	5	27	102	76	3.19	3.00	3.00	3.00	0.74
Positive environment	210	8	41	98	63	3.00	3.00	3.00	3.00	0.81
Managing change	209	8	22	102	77	3.19	3.00	3.00	3.00	0.77
Focus on priorities	211	2	20	112	77	3.25	3.00	3.00	3.00	0.66
Performance appraisal	204	6	29	117	52	3.05	3.00	3.00	3.00	0.72
Problem correction	210	7	37	108	58	3.03	3.00	3.00	3.00	0.77
Management Support Subscale	198					3.11	3.00	3.00	3.00	0.67

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 20: Measures of Central Tendency for Items in the Management Support Subscale

Training Subscale

Training generally was not considered to be adequate (M = 2.88, SD = 0.63). Mean scores for orientation (M = 2.90, SD = 0.75), technical training (M = 2.85, SD = 0.73), and training on the "people side" of the job (M = 2.77, SD = 0.79) fell below the minimum standard for "true." Continuing education support was the only item that received a positive mean score (M = 3.02, SD = 0.79) (See Table 22 on page 107).

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Pay equity (internal)	210	13	45	126	26	2.79	3.00	3.00	3.00	0.74
Pay equity (external)	208	27	71	86	24	2.51	3.00	3.00	3.00	0.86
Growth rewarded	210	17	95	83	15	2.46	2.00	2.00	3.00	0.75
Longevity rewarded	208	9	36	131	32	2.89	3.00	3.00	3.00	0.70
Advancement opportunities	209	20	85	92	12	2.46	2.00	2.00	3.00	0.75
Support for college	205	20	72	90	23	2.57	3.00	3.00	3.00	0.82
Meaningful recognition	210	21	85	88	16	2.47	2.00	3.00	3.00	0.78
Career Growth Subscale	198					2.59	2.57	3.00	3.00	0.56

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 21: Measures of Central Tendency for Items in the Career Growth Subscale

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Orientation	210	9	45	113	43	2.90	3.00	3.00	3.00	0.75
Technical training	209	6	56	111	36	2.85	3.00	3.00	3.00	0.73
Training on “people side”	210	7	62	113	28	2.77	3.00	3.00	3.00	0.72
Continuing education	209	8	39	103	59	3.02	3.00	3.00	3.00	0.79
Training Subscale	205					2.88	3.00	3.00	3.00	0.63

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 22: Measures of Central Tendency for Items in the Training Subscale

Staffing

Perceptions regarding staffing adequacy were mixed (M = 2.74, SD = 0.52). This was evident with respect to PHNs' perceptions regarding the level of staffing needed to meet day-to-day service demands (M = 2.67, SD = 0.72) or to respond to public health emergencies (M = 2.62, SD = .73), or manage their workloads (M = 2.86, SD = 0.64). The greatest concern was the fair distribution of work (M = 2.43, S D = .76). However, despite these concerns, PHNs generally believed they were able to meet priorities established for their jobs (M = 3.05, SD = 0.58) (See Table 23 on page 109).

Autonomy

The nurses in this study generally considered their PHN practice to be autonomous (M = 3.0, SD = 0.53). They perceived they had sufficient scheduling flexibility (M = 3.02, SD = 0.70) and authority to do their jobs (M = 3.09, SD = 0.66). They had the freedom to network with others (M = 3.20, SD = 0.62) and they believed they were making a difference (M = 3.09, SD = 0.65). However, although new ideas were encouraged in the workplace (M = 3.00, SD = 0.72), they were not always perceived to have been implemented (M = 2.78, SD = 0.74) (See Table 24 on page 109).

Teamwork

The PHNs in this study generally perceived they worked within well-functioning teams (M = 3.11, SD = 0.52). There was a sense of collaboration (M = 3.16, SD = .56) and mutual respect (M = 3.05, SD = .66). New team members were welcomed (M = 3.18, SD = .60) and everyone pitched in to help as needed (M = 3.18, SD = .56). Laughter was a common occurrence (M = 3.10, SD = .67), with humor serving as method for stress relief (M = 3.12, SD = .67) (See Table 25 on page 111).

Item	# PHNs	# VU	U	# T	# VT	Mean	Median	Mode	Range	SD
Manageable workload	211	8	36	145	22	2.86	3.00	3.00	3.00	0.64
Day-to-day staffing	209	12	64	115	18	2.67	3.00	3.00	3.00	0.72
Disaster response staffing	210	18	56	119	13	2.62	3.00	3.00	3,00	0.73
Fair work distribution	206	23	84	91	11	2.43	2.00	3.00	3.00	0.76
Meeting priorities	211	2	25	145	39	3.05	3.00	3.00	3.00	0.58
Timely information	210	7	43	139	21	2.83	3.00	3.00	3.00	0.64
Staffing Subscale	202					2.74	2.83	3.00	3.00	0.52

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 23: Measures of Central Tendency for Items in the Staffing Subscale

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Freedom to network	210	2	17	127	64	3.20	3.00	3.00	3.00	0.62
Making a difference	210	2	30	126	52	3.09	3.00	3.00	3.00	0.65
Having sufficient authority	210	5	29	134	42	3.01	3.00	3.00	3.00	0.66
Skills fully used	210	4	42	126	38	2.94	3.00	3.00	3.00	0.68
Ideas encouraged	211	5	40	117	49	3.00	3.00	3.00	3.00	0.72
Ideas implemented	210	9	57	112	29	2.78	3.00	3.00	3.00	0.74
Scheduling flexibility	209	7	28	127	47	3.02	3.00	3.00	3.00	0.70
Autonomy Subscale	202					3.00	3.00	3.00	3.00	0.53

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 24: Measures of Central Tendency for Items in the Autonomy Subscale

Practice Model

The PHNs in this study generally perceived the need for greater influence over organizational matters affecting their public health practice (M = 2.60, SD = 0.64). Many reported they lacked information about the "big picture" (M = 2.68, SD = 0.76) and had little input into decision-making (M = 2.66, SD = 0.77). Furthermore, they lacked opportunities to provide input to upper management (M = 2.40, SD = .79) or serve on agency councils/committees (M = 2.66, SD = .77). They reported they were not always encouraged participate in professional organizations (M = 2.68, SD = .72), or to engage in academic/practice partnerships (M = 2.67, SD =.72) (See Table 26 on page 111).

Service Excellence

For the most part, the PHNs in this study described their public health agency as having a focus on service excellence (M = 3.02, SD = 0.54). They considered the agency's services to be mission-driven (M= 3.14, SD = .60). They described a focus on customer service excellence (M = 3.17, SD = .61) and on collaboration with public health partners (M = 3.09, SD = .67). On the other hand, PHNs did not always believe their agencies hired the right mix of qualified people (M = 2.81, SD = .64). Formal systems were not always in place to evaluate and continuously improve the quality of the agency's programs and services (M = 2.93, SD = .64) (See Table 27 on page 112).

Summary of Findings regarding the PHN Work Environment

A number of important issues regarding the PHN work environment in Texas were identified in this study. Mean subscale scores revealed that PHNs had the most favorable perceptions regarding management support, autonomy, teamwork, and service excellence. On the other hand, mean subscale scores below 3.00 (i.e., < "true') were found with regard to training, staffing, career growth, and a

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Work well together	211	2	13	146	50	3.16	3.00	3.00	3.00	0.56
Enjoy coworkers	209	1	24	128	56	3.14	3.00	3.00	3.00	0.62
Laughter	211	5	22	130	54	3.10	3.00	3.00	3.00	0.67
Communication	211	4	28	140	39	3.01	3.00	3.00	3.00	0.63
Stress relief (humor)	210	5	21	128	56	3.12	3.00	3.00	3.00	0.67
Pitch in	210	0	17	138	55	3.18	3.00	3.00	3.00	0.56
Respect	211	5	25	135	46	3.05	3.00	3.00	3.00	0.66
Welcome new staff	211	3	12	136	57	3.18	3.00	3.00	3.00	0.60
Teamwork Subscale	204					3.11	3.00	3.00	3.00	0.52

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 25: Measures of Central Tendency for Items in the Teamwork Subscale

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Big picture	209	15	58	114	22	2.68	3.00	3.00	3.00	0.76
Decision-making	210	20	82	95	13	2.48	3.00	3.00	3.00	0.75
Input to upper management	209	24	94	75	16	2.40	2.00	2.00	2.00	0.79
Agency councils/committees	209	18	56	115	20	2.66	3.00	3.00	3.00	0.77
Professional organizations	204	15	52	121	16	2.68	3.00	3.00	3.00	0.72
Academic partnerships	210	14	64	110	22	2.67	3.00	3.00	3.00	0.72
Practice Model Subscale	198					2.61	2.67	3.00	3.00	0.64

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 26: Measures of Central Tendency for Items in the Practice Model Subscale

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Public health mission	207	1	22	132	52	3.14	3.00	3.00	3.00	0.60
Qualified people	211	7	46	139	19	2.81	3.00	3.00	3.00	0.64
Quality improvement	207	4	40	129	34	2.93	3.00	3.00	3.00	0.66
Customer services	209	3	15	134	57	3.17	3.00	3.00	3.00	0.61
Collaboration with partners	210	5	23	131	51	3.09	3.00	3.00	3.00	0.67
Service Excellence Subscale	202					3.02	3.00	3.00	3.00	0.54

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 27: Measures of Central Tendency for Items in the Service Excellence Subscale

participatory professional public health practice model. Mean item scores revealed that many PHNs perceived the need for greater support with respect to managerial coaching, internal pay equity, external pay equity, rewards for professional growth, rewards for longevity, advancement opportunities, support for college, meaningful recognition, new employee orientation, technical training, training on the "people side" of the job, a manageable workload, day-to-day staffing adequacy, disaster response staffing adequacy, the fair distribution of work , the receipt of timely information, the ability to fully use skills, the ability to implement new ideas, knowledge about the "big picture" within the organization, participatory decision-making, ability to provide input to upper management, participation in agency councils/committees, participation in professional organizations, participation in academic/practice partnerships, hiring the right mix of qualified people, and maintaining systems to measure and continuously improve quality.

RESEARCH QUESTION 3: HOW DO PHNS PERCEIVE THEIR JOB SATISFACTION, ORGANIZATIONAL COMMITMENT, AND INTENT TO STAY?

Job Satisfaction

Hoppock's Job Satisfaction Scale (HJSS) is a 4-item scale that was used to measure the job satisfaction of PHNs (Hoppock, 1935). Each item contained either six or seven individually worded responses that were then given a numerical value. Frequencies and measures of central tendency were calculated. As indicated by the mean score for the HJSS scale (M = 20.37, SD = 3.21), the PHNs who participated in this survey generally perceived a high level of satisfaction with the

Component (Scale)	# PHNs	# Items	Min	Max	Mean	Median	Mode	Range	SD
Total HJSS	207	4	7.00	26.00	20.37	21.00	21.00	19	3.21

Table 28: Measures of Central Tendency for the HJSS (Total Scores)

Item	# PHNs	# Response Set Options	# $\leq$ Nt	# Nt	# $\geq$ Nt	Mean	Median	Mode	Range	SD
How well job liked	210	7	13	6	191	5.53	5.00	5.00	6.00	1.15
Compared to others	209	7	10	8	191	5.53	6.00	6.00	5.00	0.88
Time satisfied	210	6	19	26	165	4.79	5.00	5.00	4.00	0.77
Staying in job	210	6	17	74	89	4.55	5.00	5.00	5.00	1.04

Nt = Neutral

Table 29: Measures of Central Tendency for Items in the HJSS (Mean Scores)

jobs they performed (See Table 28 on page 113). For the most part, they liked their jobs (M = 5.53, SD = 1.15, maximum score = 7.00). Furthermore, they believed they experienced a higher level of satisfaction than most other people had with their jobs (M = 5.53, SD = 0.88, maximum score = 7.00). In addition, they reported being satisfied with their jobs most of the time (M = 4.79, SD = 0.77, maximum score = 6.00). Finally, they expressed an interest in staying in their current jobs (M = 4.55, SD = 1.04, maximum score = 6.00) (See Table 29 on page 113).

Organizational Commitment

The 7-item MRI Organizational Commitment Scale (MRI-OC) was composed of two subscales, which were designed to measure commitment and commitment-related concerns. This instrument used the same 4-point Likert-type response set that was used for the PH-MRI. The items in the concerns subscale were reverse coded prior to calculating an overall score for the MRI-OC. Measures of central tendency were used to analyze survey data. Total subscale scores demonstrated that the organizational commitment of PHNs was high (M = 13.50, SD = 2.11) and there were relatively few concerns (M = 5.61, SD = 1.63) (See Table 30 on page 115). Mean subscale scores allowed a direct comparison of the high level of commitment (M = 3.29, SD = 0.53) and low level of concerns (M = 1.87, SD = 0.54) reported by PHNs (See Table 31 on page 115). Each of the subscales of the MRI-OC was evaluated further.

Commitment subscale. Mean item scores revealed that PHNs generally believed their jobs were "worth it" (M = 3.35, SD = 0.58). They said positive things about their public health employers (M = 3.00, SD = 0.53). They would encourage others to apply for

.Component (Subscale)	# Items	# PHNs	Min	Max	Mean	Median	Mode	Range	SD
Commitment	4	207	7.00	16.00	13.50	12.00	12.00	9.00	2.11
Concerns*	3	209	3.00	12.00	5.61	5.61	6.00	9.00	1.63
Total MRI-OC*	7	205	7	28	22.52	22.00	21.00	15.00	3.18

*Items in the Concerns Subscale were reverse coded prior to total score calculation

Table 30: Measures of Central Tendency for the MRI-OC (Total Scores)

.Component (Subscale)	# Items	# PHNs	Min	Max	Mean	Median	Mode	Range	SD
Commitment	4	207	1.00	4.00	3.29	3.00	3.00	2.25	0.53
Concerns*	3	209	1.00	4.00	1.87	2.00	2.00	3.00	0.54
Total MRI-OC*	7	205	1.00	4.00	3.22	3.00	3.00	2.14	0.45

*Items in the Concerns Subscale were reverse coded prior to total score calculation

Table 31: Measures of Central Tendency for the MRI-OC (Mean Scores)

employment with their public health agencies (M = 3.20, SD 0.69). They also felt a strong sense of commitment to their organizations as a whole (M = 3.25, SD = 0.59). Median and mode scores corresponded with these findings (See Table 32 on page 116).

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Feel committed	211	1	14	128	58	3.25	3.00	3.00	3.00	0.53
Say positive things	208	5	0	126	77	3.00	3.00	3.00	2.00	0.53
Encourage work here	210	3	23	112	72	3.20	3.00	3.00	3.00	0.69
Job worth it	211	1	8	117	84	3.35	3.00	3.00	3.00	0.58
Commitment Subscale	207					3.29	3.00	3.00	2.25	0.53

VU = Very Untrue, U = Untrue, T = True, VT = Very True

Table 32: Measures of Central Tendency for Items in the Commitment Subscale (Mean Scores)

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Work stress	209	32	133	37	7	2.09	2.00	2.00	3.00	0.68
Feel withdrawn	211	78	123	8	2	1.69	2.00	2.00	3.00	0.68
Burned out	211	68	114	26	3	1.83	2.00	2.00	3.00	0.59
Concerns Subscale♦	209					1.83	2.00	2.00	3.00	0.69

VU = Very Untrue, U = Untrue, T = True, VT = Very True, ♦ Items reverse coded before calculating the total MRI-OC

Table 33: Measures of Central Tendency for Items in the Concerns Subscale (Mean Scores)

Concerns subscale. When respondents were asked whether work stresses were excessive, the mean item score indicated that some PHNs did not consider this to be "untrue" (M = 2.09, SD = 0.68). However, respondents generally reported they did not feel withdrawn at work (M = 1.69, SD = 0.59), nor did they feel burned out (M = 1.87, SD = 0.54) (See Table 33 above).

Intent to Stay

The Public Health Intent to Stay Scale (PH-ITS) consisted of four items designed to measure PHNs' intent to leave or stay with their public health agency employers. Intent to stay was further evaluated in terms of time frames (i.e., one year, five years, or as long as possible). The same 4-point Likert-type response set used for the PH-MRI and MRI-OC also was used for the PH-ITS.

Measures of central tendency were used to analyze survey data. First, the total intent to stay score was evaluated. This revealed a somewhat low mean score (M = 11.69, SD = 2.94), which was found to be consistent with the median (12.00) and mode (12.00) (See Table 34 on page 118). Next, mean subscale and item scores were evaluated. Most PHNs intended to stay for at least one year (M = 3.25, SD = 0.64). However, many thought about leaving (M = 2.15, SD = 0.96). Furthermore, they doubted they would stay beyond 5 years (M = 2.78, SD = 0.74) or for as long as possible (M = 2.78, SD = 0.91) (See Table 35 on page 118).

Summary of Findings Regarding Work Environment Outcome Measures

The HJSS was used to measure PHNs' perceptions of job satisfaction. Overall, PHNs were found to be satisfied with their jobs. The MRI-OC scale measured PHNs' perceptions regarding their organizational commitment. Nurses responded favorably when asked about their levels of commitment. Work stress was reported to some degree; otherwise, there were relatively few concerns. The PH-ITS scale measured PHNs' intent to stay with their public health employers. In general, PHNs perceived that they would stay with for at least one year. However, they were less inclined to stay for five years or more.

Component (Scale)	# PHNs	# Items	Min	Max	Mean	Median	Mode	Range	SD
Total PH-ITS	207	4	4	16	11.69	12.00	12.00	12.00	2.94

Table 34: Measures of Central Tendency for the Total PH-ITS (Total Scores)

Item	# PHNs	# VU	# U	# T	# VT	Mean	Median	Mode	Range	SD
Leave permanently♦	211	60	83	45	23	2.15*	2.00*	2.00*	3.00	0.96
Stay 1+ years	208	5	12	117	74	3.25	3.00	3.00	3.00	0.67
Stay 5+ years	208	18	52	85	53	2.83	3.00	3.00	3.00	0.91
Stay as long as possible	211	18	61	81	51	2.78	3.00	3.00	3.00	0.91
Total PH-ITS Scale						2.92	3.00	3.00	3.00	

VU = Very Untrue, U = Untrue, T = True, VT = Very True, ♦ Item reverse coded before calculating the total PH-ITS

Table 35: Measures of Central Tendency for Items in the PH-ITS Scale (Mean Scores)

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RESEARCH QUESTION 4: HOW DO THE WORK ENVIRONMENT, JOB SATISFACTION, AND ORGANIZATIONAL COMMITMENT PREDICT PHNS' INTENT TO STAY?

Spearman's Rho correlations were performed to determine whether statistically significant relationships existed between PHNs' perceptions of the work environment (PH-ITS), organizational commitment (MRI-OC), job satisfaction (HJSS), and intent to stay (PH-ITS). Positive, low-to-moderate correlations were found between all variables. The lowest correlation was found between the work environment and intent to stay ($r = .46$, $p = .01$). The highest correlation was found between organizational commitment and job satisfaction ($r = .69$, $p = .01$). All correlations were significant at the .01 level (Munro, 2005) (See Table 36 below).

	PH-MRI	MRI-OC	HJSS	PH-ITS
PH-MRI	1.00	0.63**	0.47**	0.46**
MRI-OC		1.00	0.69**	0.54**
HJSS			1.00	0.52**
PHITS				1.00

** Correlation is significant at the .01 level (two-tailed)

Table 36: Correlation between the PH-MRI and Outcome Variables

Individual versus Multiple Predictors

Simple linear regression was performed to separately analyze the work environment, job satisfaction, and organizational commitment as predictors of PHNs' intent to stay with their employers. First the work environment (PH-MRI) was tested and was found to be a statistically significant predictor of intent to stay ($\beta = .06$, $p = .00$). The coefficient of determination (R^2) was 0.21. This indicated that the work environment explained 21% of the variance in intent to stay (See Table 37 on page 120).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.46	.21	.21	2.63	.21	42.65	1	157	.00

Predictors (1): (Constant), PH-MRI

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta		
1	(Constant)	3.17	1.34		2.37	.02
	PH-MRI	.06	.01	.46	6.53	.00

Dependent Variable: PH-ITS

Table 37: The Work Environment as a Predictor of Intent to Stay

Next, job satisfaction (HJSS) was tested and found to serve as a predictor of intent to stay ($\beta = .06$, $p = .00$). The coefficient of determination (R^2) was 0.27. Therefore, job satisfaction was found to explain 27% of total variance in intent to stay (See Table 38 on page 121).

Finally, organizational commitment (MRI-OC) was tested. It also was found to serve as a predictor of intent to stay ($\beta = .49$, $p = .00$). The coefficient of determination (R^2) was 0.27, which indicated that organizational commitment explained 27% of the total variance in intent to stay (See Table 39 on page 121).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.52	.27	.27	2.47	.27	74.34	1	201	.00

Predictors (1): (Constant), HJSS

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta		
1	(Constant)	2.32	1.11		2.09	.04
	HJSS	.47	.05	.52	8.62	.00

Dependent Variable: PH-ITS

Table 38: Job Satisfaction as a Predictor of Intent to Stay

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.54	.29	.28	2.48	.29	79.66	1	199	.00

Predictors (1): (Constant), MRI-OC

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	p
		B	Std. Error	Beta		
1	(Constant)	.64	1.25		.51	.61
	MRI-OC	.49	.06	.54	8.93	.00

Dependent Variable: PH-ITS

Table 39: Organizational Commitment as a Predictor of Intent to Stay

After the work environment, job satisfaction, and organizational commitment were shown to independently serve as predictors, the next step was to determine how these variables worked in combination to predict PHNs' perceived intent to stay. Based on the middle range theory for this PHN study, a hierarchical linear regression model was generated. The work environment (PH-MRI) was entered as the first predictor variable; job satisfaction (HJSS) and organizational commitment (MRI-OC) variables were entered next. The resulting regression model (Model 2) was found to be statistically significant (p = .00).

The coefficient of determination for the model ($R^2 = 0.42$) containg three predictors did a better job than any single predictor in explaining total variance in intent to stay. The Durbin-Watson and Variance Inflation Factor (VIF) statistics fell within acceptable limits, indicating that multicollinearity was not of concern (Field, 2005; 2013). However, although job satisfaction ($\beta = .25$, $p = .00$) and organizational commitment ($\beta = .35$, $p = .00$) remained statistically significant predictor variables, the work environment variable (PH-MRI) became statistically non-significant ($\beta = .01$, $p = .54$) (See Table 40 on page 123).

This three predictor model revealed the possibility of mediation by job satisfaction and/or organizational commitment because of the change in the effect of the work environment (Baron & Kenny, 1986; Field, 2005; 2013; Hayes, 2013; Miles & Shevlin, 2001). Further analysis was required to evaluate the potential for mediation. First, job satisfaction and organizational commitment were analyzed as independent mediator variables. Next, the relationship between proposed mediator variables was analyzed. The four-step method prescribed by Baron and Kenny (1996) was used to

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df2	Sig. F Change	
1	.44	.20	.19	2.63	.20	37.13	1	152	.00	
2	.65	.42	.41	2.24	.23	29.74	2	150	.00	1.41

Predictors: (Constant),PH-MRI, HJSS, MRI-OC

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	p.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.45	1.39		2.48	.01		
	PH-MRI	.06	.01	.44	6.09	.00	1.00	1.00
2	(Constant)	-2.08	1.39		-1.50	.14		
	PH-MRI	.01	.01	.05	.61	.54	.57	1.75
	HJSS	.25	.08	.29	3.28	.00	.39	1.96
	MRI-OC	.35	.09	.39	3.89	.00	.51	2.57

Dependent Variable: PH-ITS

Table 40: Stepwise Linear Regression 3-Predictor Model of Intent to Stay

make these determinations. Finally, the possibility of satisfaction-to-commitment serial mediation was analyzed. Serial mediation analysis required the use of a separate SPSS macro called Process (Hayes, 2013).

Job Satisfaction as a Mediator

In the first mediation analysis, the work environment (PH-MRI) represented the independent variable (*X)*. Intent to stay (PH-ITS) represented the dependent variable. (*Y*). Job satisfaction represented the mediating variable (M_1). Findings are summarized in Table 41 on page 125. The mediated model ($R^2 = 0.36$) explained a greater proportion of total variance in intent to stay than the work environment explained alone. Also, when controlling for job satisfaction in the mediated model, the R^2 change fell to 0.06. Furthermore, although the β value (or effect) of the work environment remained statistically significant, it was reduced by 50% (i.e., β = .03, p = .00) when compared to the non-mediated model (*XY*). The Sobel test was statistically significant. In combination, these findings indicated that partial mediation by job satisfaction had occurred (Miles & Shevlin, 2001; Preacher & Hayes, 2004).

This causal relationship can be visually depicted as a triangle, with sides representing β values for mediated and direct effects (Hayes, 2013). Side "a^1" represents the β value (or effect) of the work environment (*X* = PH-MRI) on job satisfaction as the mediator (M_1 = HJSS). Side "b^1" represents the β value of job satisfaction on intent to stay (*Y* = PH-ITS). Side "c^1" represents the remaining non-mediated effect of the work environment on intent to stay. Figure 6 on page 125 illustrates these relationships.

Direct, Indirect, and Total Effects						
	R^2	R^2 Change (due to X)	β	SE	t	p
a^1 (M_1X)	0.22		0.07	0.01	6.72	0.00
b^1($YM_1.X$)	0.36		0.38	0.01	3.72	0.00
c^1($YX.M_1$)	0.36	0.06	0.03	0.07	5.77	0.00
c'(XY)	0.21	0.21	0.06	0.01	6.59	0.00
Sobel Test for Indirect Effects and Significance using Normal Distribution						
	Value	SE	LL95%	UL95%	Z	p
Sobel	0.02	0.01	0.01	0.04	4.30	0.00
Bootstrap Results for Indirect Effect (number of bootstrap examples = 1,000)						
	Mean	SE	LL95%	UL95%	LL99%	UL99%
Total Effect	0.02	0.01	0.01	0.04	0.01	0.05
N = 156						

X = Work Environment, *Y* = Intent to stay, M_1 = Job Satisfaction

Table 41: Job Satisfaction as a Mediator between the Work Environment and Intent to Stay

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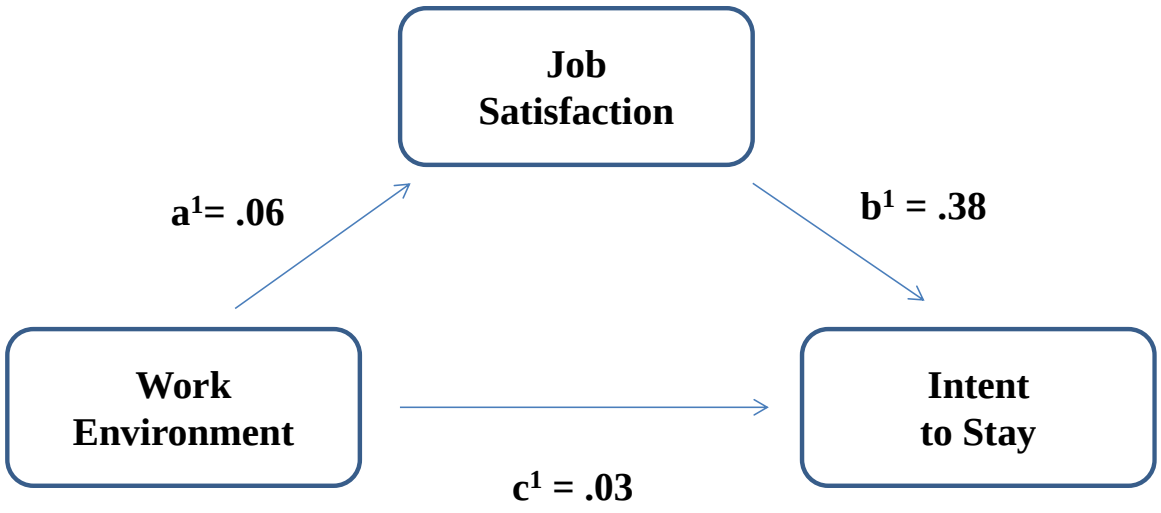

Figure 6: Job Satisfaction as a Mediator between the Work Environment and Intent to Stay

Organizational Commitment as a Mediator

In the second mediation analysis, the work environment (PH-MRI) represented the independent variable (*X*). Intent to stay (PH-ITS) represented the dependent variable (*Y*) and organizational commitment (MRI-OC) represented the mediator variable (M_2). Results of the mediation analysis are summarized in Table 42 on page 127. The mediated two variable model explained a greater proportion of the total variance in intent to stay ($R^2 = 0.38$) than the work environment variable alone ($R^2 = 0.21$). However, the R^2 change attributed to the work environment was reduced to 0.01. Furthermore, the beta weight (or effect) attributed to the work environment became statistically non-significant (i.e., $\beta = .06$, $p = .23$). In combination, these findings indicated that organizational commitment fully mediated the relationship between the work environment (PH-MRI) and intent to stay
(PH-ITS). The Sobel test was statistically significant ($p = .00$), confirming that mediation had occurred.

This causal relationship also is depicted as a triangle, with sides representing β values for mediated and direct effects (Hayes, 2013). Side "a^2" represents the β value or effect of the work environment (*X* = PH-MRI) on organizational commitment as the mediator (M_2 = MRI-OC). Side "b^2" represents the β value or effect of organizational commitment on intent to stay (*Y* = PH-ITS). Side "c^2" represents the remaining non-mediated effect of the work environment on intent to stay (See Figure 7 on page 127).

Direct, Indirect, and Total Effects						
	R^2	R^2 Change (due to X)	β	SE	t	p
a^2 (M_2X)	0.39		0.09	0.01	6.78	0.00
b^2($YM_2.X$)	0.38		0.50	0.07	6.80	0.00
c^2($YX.M_2$)	0.38	0.01	0.01	0.01	3.20	0.00
c'(XY)	0.21	0.21	0.06	0.01	6.59	0.00
Sobel Test for Indirect Effects and Significance using Normal Distribution						
	Value	SE	LL95%	UL95%	Z	p
Sobel	0.04	0.01	0.03	0.06	5.56	0.00
Bootstrap Results for Indirect Effect						
	Mean	SE	LL95%	UL95%	LL99%	UL99%
Total Effect	0.04	0.01	0.02	0.06	0.02	0.07
N = 156						

X = Work Environment, *Y* = Intent to Stay, M_2 = Organizational Commitment

Table 42: Organizational Commitment as a Mediator between the Work Environment and Intent to Stay

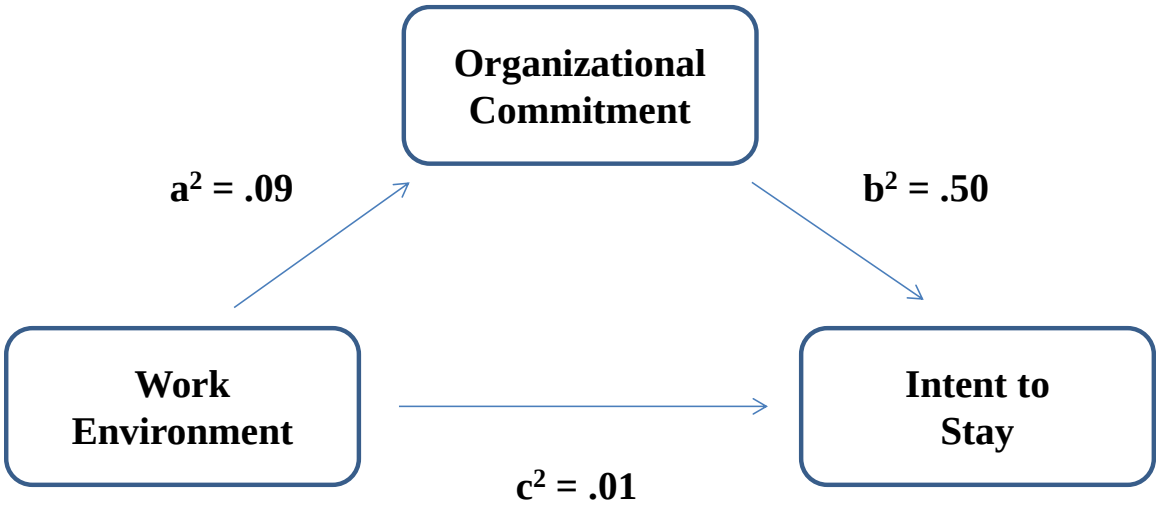

Figure 7: Organizational Commitment as a Mediator between the Work Environment and Intent to Stay

In the third mediation analysis, job satisfaction (HJSS) represented the independent variable (*X*). Intent to stay (PH-ITS) represented the dependent variable (*Y*). Organizational commitment represented the mediator variable (M_2). Data were analyzed using the four-step method of mediation analysis prescribed Baron and Kenny (1996) and findings are summarized in Table 43 on page 129. The mediated two variable model explained a greater proportion of the total variance in intent to stay ($R^2 = 0.37$) than job satisfaction alone ($R^2 = 0.27$). However, the R^2 change attributed to job satisfaction was reduced to 0.05. Furthermore, the beta weight attributed to job satisfaction (i.e., $\beta = .26$, $p = .00$) was reduced by approximately 50%. In combination, these findings indicated that organizational commitment partially mediated the relationship between job satisfaction (HJSS) and intent to stay (PH-ITS). The Sobel test was statistically significant ($p = .00$), confirming that mediation had occurred.

Mediation by organizational commitment can be visually depicted as a triangle, with sides representing β values for the mediated and direct effects (Hayes, 2013). Side "a^3" represents the β value or effect of job satisfaction (*X* = HJSS) on organizational commitment (M_2 = MRI-OC) as the mediating variable. Side "b^3" represents the β value or effect of organizational commitment on intent to stay (PH-ITS), which is the outcome variable (*Y*). Side "c^3" represents the remaining non-mediated effect of job satisfaction on intent to stay. Figure 8 on page 129 illustrates these relationships.

Direct, Indirect, and Total Effects						
	R^2	R^2 Change (due to X)	β	SE	t	p
a^3 (M_2 X)	0.48		0.69	0.05	13.50	0.00
b^3($YM_2.X$)	0.37		0.33	0.07	4.68	0.00
c^3($YX.M_2$)	0.37	0.05	0.26	0.07	3.73	0.00
c'(XY)	0.27	0.27	0.46	0.05	8.62	0.00
Sobel Test for Indirect Effect and Significance using Normal Distribution						
	Value	SE	LL95%	UL95%	Z	p
Sobel	0.23	0.05	0.13	0.34	4.41	0.00
Bootstrap Results for Indirect Effect (number of bootstrap examples = 1,000)						
	Mean	SE	LL95%	UL95%	LL99%	UL99%
Total Effect	0.23	0.05	0.13	0.34	0.10	0.38
N = 197						

X = Job Satisfaction, *Y* = Intent to Stay, M_2 = Organizational Commitment

Table 43: Organizational Commitment as a Mediator between the Job Satisfaction and Intent to Stay

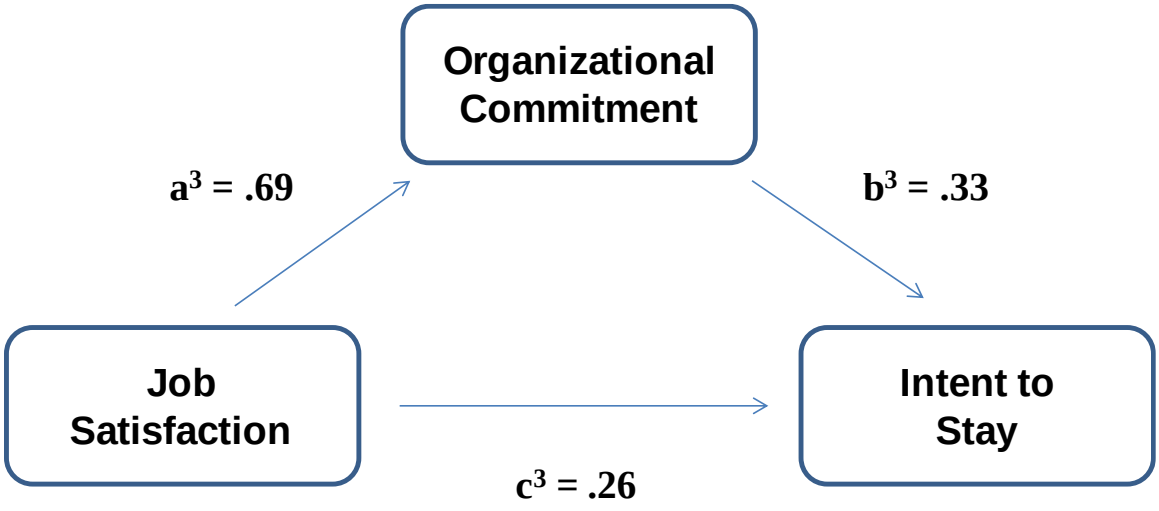

Figure 8: Organizational Commitment as a Mediator between Job Satisfaction and Intent to Stay

Satisfaction-to-Commitment Serial Mediation

Model 6 of the Process macro for SPSS was used to test for serial mediation. The work environment (PH-MRI) was entered as the independent variable (*X*). Intent to stay (PH-ITS) was entered as the dependent (or outcome) variable (*Y*). Job satisfaction was entered as the first mediator (M_1) and organizational commitment was entered as the second mediator (M_2). Effects (or beta weights) are calculated by controlling for the variables that preceded them in the serial mediation chain (Hayes, 2013). Satisfaction-to-commitment serial mediation was found to occur in this PHN study, with the effect between *X* and *Y* (i.e., (i.e., $\beta = .01$, $p = .54$) rendered statistically non-significant. In combination, these findings indicated that satisfaction-to-commitment serial mediation had occurred (See Table 44 on page 131).

The causal relationship between the work environment (*X*) and intent to stay (*Y*) can be visually depicted by a set of two triangles, with connecting lines forming a serial mediation model with four sides. The triangle to the left provides β values attributed to job satisfaction as the first mediator (M_1). The triangle to the right provides β values for organizational commitment as the second mediator (M_2). The intersecting line at the top of the model demonstrates the effect of M_1 on M_2. .The line at the bottom of the model represents the remaining effect (or β value) of the relationship between *X* and *Y* (See Figure 9 on page 132).

Summary of Findings Regarding Mediation

In summary, the satisfaction-to-commitment serial mediation model did a much better job at predicting intent to stay (i.e., $R^2 = .42$, $p = .00$) than any single predictor variable alone. The work environment (PH-MRI) was shown to be partially mediated by

Direct, Indirect, and Total Effects						
	β	SE	t	*p*		
$a^1(M_1X)$	0.07	0.01	6.45	0.00		
$b^1(YM_1.M_2M_1X)$	0.26	0.08	3.28	0.00		
$a^2(M_2X.M_1X)$	0.06	0.01	6.94	0.00		
$b^2(YM_2.M_2M_1X)$	0.35	0.09	3.89	0.00		
$a^3(M_2M_1.M_1X)$	0.49	0.06	8.46	0.00		
$c^4(YX.M_2M_1X)$	0.01	0.01	0.61	0.54		
c'(*XY*)	0.06	0.01	6.59	0.00		
Sobel Test for Indirect Effects of *X* on *Y*						
	Value	SE	t	*p*	LL95%	UL95%
Sobel Test	0.06	0.01	6.09	0.00	0.04	0.07
Bootstrap Results for Indirect Effects (number of bootstrap examples = 1,000)						
	Value	SE	t	*p*	LL95%	UL95%
Pathways	0.06	0.01	6.09	0.00	0.04	0.07
$X \rightarrow M_2 \rightarrow Y$	0.03	0.01		0.05*	0.01	0.05
$X \rightarrow M_1 \rightarrow M_2 \rightarrow Y$	0.01	0.00		0.05*	0.00	0.01
$X \rightarrow M_1 \rightarrow Y$	0.00	0.0		*NS**	<0.00	0.00
N = 154						

X = Work Environment, *Y* = Intent to Stay, M_1 = Job Satisfaction, M_2 = Organizational Commitment, *NS* = Non Significant

Table 44: Satisfaction-to-Commitment Serial Mediation

job satisfaction (HJSS) as the first mediator. Thereafter, organizational commitment (MRI-OC) produced complete mediation between the work environment and intent to stay.

Post Hoc Power Analysis

A post-hoc power analysis was performed using G*Power 3.1. This test was based on an α error of .05, an effect of .42, a total of three predictor variables (i.e., the serial mediation model), and a sample size for regression analysis of 211 PHNs. This resulted in the highest possible power (i.e., the 1 – β error probability) of 1.00. The non-centrality

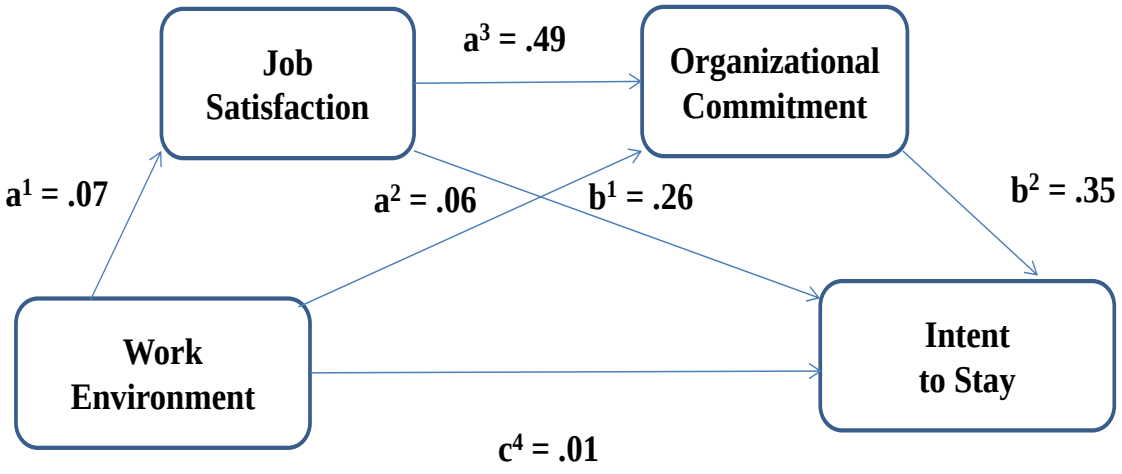

Figure 9: Satisfaction-to-Commitment Serial Mediation

parameter λ was 88.62. This indicated that the total sample size for the study was well above the 89 PHNs that would have been required to ensure adequate statistical power (Faul et al., 2009).

Chapter Summary

This study was designed to examine the relationships between the PHN work environment in Texas and three critical work environment outcomes. First, the demographic characteristics of the survey sample were analyzed. Next, survey data were analyzed to answer each of the research questions posed for this study. Finally, a post-hock power analysis was performed.

Demographic analyses revealed that majority of survey respondents were RNs, with LVNs and APRNs representing the other license types. Most PHNs were female, White, and not of Hispanic/Latino ethnicity. Their average age was 53 years. They reported a variety of job roles, including clinical service provider, public health generalist, program specialist, manager/supervisor, and director/administrator. The majority indicated that a nursing license was required for their job.

To answer the first research question, psychometric testing was performed on each of the four survey instruments used for this study. Exploratory factor analysis and validity and reliability testing were conducted. For each of the instruments, items were found to fall into a logical scale/subscale structure. Furthermore, each of the instruments was found to be highly valid and reliable in the public health setting.

To answer the second research question, characteristics of the work environment were analyzed using data collected from the PH-MRI survey instrument. Mean subscale scores revealed generally favorable perceptions regarding management support, autonomy, teamwork, and overall focus on service excellence. On the other hand, less than favorable perceptions were reported regarding career growth opportunities, new employee orientation/training, staffing adequacy, and ability to participate in a shared governance practice model.

To answer the third research question, survey responses regarding work environment outcomes were analyzed. Data collected from the HJSS revealed that PHNs had a high degree of job satisfaction. Survey data from the MRI-OC demonstrated that PHNs felt a high degree of organizational commitment. Furthermore, they experienced some work stress but otherwise had few commitment-related concerns. Data from the PH-ITS scale revealed that a majority of PHNs planned to stay with their public health employers.

To answer the fourth research question, inferential statistics were performed to determine how well the work environment, job satisfaction, and organizational commitment predicted intent to stay. Multiple linear regression revealed that the best predictor model included all three of the independent variables. However, the presence of one or more mediator variables also was indicated. Further analysis revealed that there was satisfaction-to-commitment serial mediation in the causal relationship between the

work environment and intent to stay. A post-hoc power analysis revealed that the sample size was well above the minimum number required to ensure statistical power.

CHAPTER 5: DISCUSSION

This chapter begins with a summary of the study. This is followed by a discussion of relevant findings within the context of the research literature. Limitations of the study are addressed. Finally, recommendations are made with regard to nursing practice, education, research, and policy, particularly as they relate to the recruitment and retention of PHNs.

Summary of the Study

The purpose of this study was to investigate the public health work environment and three critical work environment outcomes from the perspective of public health nurses (PHNs) in Texas. Based on a review of the business, healthcare, and public health literature, a conceptual model was developed. The grand theory of Structure-Process-Outcome (SPO) was selected to serve as the overarching framework for the study (Donabedian, 2003). Thereafter, a more detailed middle range SPO theory was developed to guide the research. *Structure* represented the relatively stable characteristics of public health agencies, including the population-based work setting, as well as the professional and personal characteristics of employed PHNs. *Process* referred to the following work environment characteristics, which were indicated based on public health agency structure and deemed essential to support PHN practice: management support, professional growth, autonomy, staffing, teamwork, practice model, and service excellence (Dingley & Yoder, 2013). Based on the work environment research literature, the following were deemed to represent the three most critical self-reported *outcomes*: job satisfaction, organizational commitment, and intent to stay (Ingersoll et al, 2002; Price & Mueller, 1986). However, intent to stay was considered to be the ultimate *outcome* of interest because it serves as the best predictor of employee turnover (Griffeth et al., 2000; Price & Mueller, 1986).

Furthermore, based on the research literature, job satisfaction and organizational commitment were considered to mediate the causal relationship between the work environment and intent to stay (Price & Mueller, 1986; Tett & Meyer, 1993).

A cross-sectional survey design was used to conduct this study. A demographic data sheet was used to capture information about public health agency *structure*. The Public Health Magnetic Resource Inventory (PH-MRI) was used to collect data regarding work environment *processes.* Work environment *outcomes* were measured using three separate instruments: Hoppock's Job Satisfaction Scale (HJSS), the Magnetic Resource Inventory Organizational Commitment (MRI-OC) scale, and the Public Health Intent to Stay (PH-ITS) scale. Institutional Review Board approval was obtained from both the University of Texas and the Texas Department of State Health Services (DSHS).

The survey sample was recruited from PHNs working for the DSHS and 19 of the 65 local health departments (LHDs) in Texas. A total of 404 survey invitations were sent to PHNs from participating health departments and 217 completed surveys were received (response rate = 54%). Survey data were analyzed using a variety of descriptive, psychometric, and inferential statistics. The demographic data in this sample were found to be comparable to those in a recent state-wide PHN enumeration study with respect to the percentages of PHNs who were licensed vocational nurses (LVNs), registered nurses (RNs), and advanced practice RNs (APRNs), as well as their distribution between the DSHS and Texas LHDs (DSHS, 2013a). Furthermore, the professional characteristics of RNs and APRNs in this study were found to be similar to those in a recent nation-wide PHN study with regard to age distribution, ethnicity, gender, job roles, programs/services provided, basic nursing education, and highest degree earned (University of Michigan, 2013). Data analyses revealed a number of issues that may influence future PHN recruitment and retention efforts. Each of these issues will be discussed further.

Psychometric testing was performed on the instruments used to measure PHNs' perceptions regarding the work environment, job satisfaction, organizational commitment, and intent to stay. A small group of public health, psychometric testing, and work environment research experts was convened to assist the Principal Investigator in analyzing the data. Exploratory factor analysis resulted in logical scale and subscale structures. A high degree of validity and reliability was found within the PHN population.

Descriptive statistics were performed on data collected about the instruments used to measure work environment processes and outcomes. In general, PHNs provided positive responses regarding the level of management support, autonomy, and teamwork experienced. They described an organizational focus on service excellence. However, staffing levels were perceived to be inadequate. Furthermore, many PHNs lacked opportunities for career growth, training, and participation in organizational matters affecting their practice. Some degree of work stress was reported. Otherwise, PHNs remained committed to their public health agencies and satisfied with their jobs. Perceptions regarding intent to stay were mixed. Although most PHNs intended to stay for at least one year, they were less certain about staying five years or more.

Hierarchical linear regression was performed to evaluate whether the work environment, job satisfaction, and organizational commitment predicted intent to stay. This three predictor model was found to be highly statistically significant ($p = .00$) with 41% of the total variance explained. Further analysis revealed that both job satisfaction and organizational commitment mediated the causal relationship between the work environment and intent to stay. A surprising finding was that satisfaction-to-commitment serial mediation was found. The conceptual model for this PHN study was modified to incorporate this result.

Discussion of Study Findings

STUDY SAMPLE

The demographic data from this survey revealed a number of issues that potentially are of concern with regard to the recruitment and retention of PHNs in Texas. First and foremost, the PHNs in this sample were found to be an aging population, with a mean age of 53 years. Furthermore, nearly 20% of respondents were over 60 years of age. These data were consistent with those found in the recent national PHN enumeration study (University of Michigan, 2013). This suggests that a high percentage of PHNs throughout the U.S. may soon be considering retirement (Center on Aging and Work, 2016).

In the Texas PHN survey, age also was found to be highly correlated with experience in nursing. On the other hand, a low correlation was found between age and years of experience in public health. This indicates that public health agencies had filled many vacant PHN positions with individuals who had prior experience in other work settings. These data were consistent with findings from the recent state-wide and national PHN enumeration studies (DSHS, 2013a; University of Michigan, 2013). However, none of these studies identified where prior work experience had been gained or how well it prepared these nurses for their public health job roles. Furthermore, it is unknown whether public health agencies hired older nurses for their prior experience or simply because they were not able to attract newly graduated nurses who could build a career in public health.

A second potential concern was the finding that approximately 45% of survey respondents were not minimally educationally prepared with a baccalaureate degree in nursing (BSN). National experts recommend the BSN as the minimum preparation for entry into population-based public health practice. The BSN provides nurses with an educational foundation in both nursing and public health science (ANA, 2013; Gebbie et

al., 2002; Quad Council, 2011). In contrast, the vocational, associate degree, and diploma nursing programs do not provide coursework in public health (Texas BON, 2013).

A third finding of potential concern was the fact that approximately 18% of survey respondents reported their primary license type as licensed vocational nurse (LVN). Texas law dictates that LVNs cannot work independently. Instead, their work must be directly supervised by either a registered nurse (RN), an advanced practice RN (APRN), a physician's assistant, a physician, a dentist, or a podiatrist (BON, 2013). Moreover, LVNs do not have the legal authority to administer, supervise, or evaluate nursing practices, policies, or procedures. Instead, these responsibilities strictly fall under the scope of the RN or APRN (Texas Board of Nursing [BON], 2013). Most LVNs who participated in the survey reported their primary role as *clinical service provider*. However, three of the LVNs who responded to the Texas PHN survey reported their primary role as *manager/supervisor*. Data from this survey were insufficient to determine whether this work was performed in compliance with Texas law. Furthermore, the recent national PHN enumeration study did not provide information for comparison because data were not collected regarding LVNs.

The fourth finding of potential concern was the fact that only approximately half (53.9%, $n = 117$) of PHNs responding to the survey worked for an agency that employed a Chief Nursing Officer (CNO) or Director of Nursing (DON). These data were consistent with findings from the recent state-wide enumeration study in Texas (DSHS, 2013a). National experts describe the CNO or DON as an essential executive position within any healthcare organization. This individual has the responsibility for ensuring that appropriate supervisory structures are in place and that all nurses have the appropriate license types and educational preparation for their jobs (Hader, 2011; IOM, 2011; Hudspeth, 2014).

The fifth finding potentially of concern was the lack of gender and racial/ethnic diversity of the PHNs who participated in this survey. These findings were consistent with those of the recent national PHN enumeration study (University of Michigan, 2013). They also are consistent with findings regarding the public health workforce as a whole (Association of Schools of Public Health [ASPH], 2013; Sellers et al., 2016). Experts consider the lack of diversity in the public health workforce to be a barrier to addressing health disparities within the populations they serve (APSH, 2013). Health disparities can only be addressed when the community is engaged in public health planning efforts. However, attempts to engage the community can be met with distrust when public health professionals do not represent the diverse populations they serve (ASPH, 2013; Centers for Disease Control [CDC], 2012).

In future PHN workforce planning, it is important that public health agencies consider recent national nursing workforce trends. First, there has been a significant increase in the pool of available RNs in the U.S. in recent years. This increase has been attributed to a surge in newly graduated nurses, as well as a significant number of older nurses who temporarily deferred their retirement during a time of economic recession (Auerbach, Buerhaus, & Staiger, 2011). Second, a national educational goal was set to increase the proportion of BSN-prepared RNs from 50% in 2010 to 80% by 2020. Furthermore, educational pathways were recommended to assist LVNs and associate degree- and diploma-prepared RNs to obtain baccalaureate and higher degrees (IOM, 2011; O'Reilly, 2014). Finally, schools of nursing in the U.S. are working to produce a more diverse nursing workforce. This includes an emphasis on males and students from minority populations who are minimally educated with baccalaureate degrees (American Association of Colleges of Nurses, 2015). Public health agencies should take these trends into account when developing strategies for the recruitment and retention of PHNs.

RESEARCH QUESTION 1: WHAT ARE THE PSYCHOMETRIC PROPERTIES OF SURVEY INSTRUMENTS?

Public Health Magnetic Resource Inventory (PH-MRI)

Psychometric testing of the PH-MRI revealed a subscale structure designed to measure each of the characteristics of the public health work environment deemed critical to PHN practice (Dingley & Yoder, 2013). Furthermore, the instrument and its subscales demonstrated a high degree of validity and reliability in the public health setting. In contrast, psychometric testing only was identified in four other U.S. studies published in the public health literature in recent years. None of those studies had a subscale structure similar to the PH-MRI. In three studies, problems with subscale structure reliability was reported (Campbell et al., 2004; Cole et al., 2010; Cumby & Alexander, 1998). In the fourth study, details regarding scale and subscale reliability were not described (Liss-Levinson, Barthapudi, Leider, & Sellers, 2015).

Three valid and reliable survey instruments specifically were designed to conduct magnet hospital work environment research (Aiken & Patrician, 2000; Kramer & Schmalenberg, 2004a, 2005; Lake, 2002). Of these, the Essentials of Magnetism (EOM) is the only one with a subscale structure specifically designed to measure critical characteristics of the nursing work environment (Kramer & Schmalenberg, 2002, 2004a, 2005). Therefore, it is important to note that the subscale structures of the EOM and PH-MRI are closely aligned. Six subscales measure exactly the same underlying phenomena: management support, training/competency development, autonomy, staffing, professional practice model, and a mission-driven dedication to service quality. The two remaining subscales are similar. However, whereas the EOM measures teamwork in terms of RN-MD relationships, the corresponding scale in the PH-MRI measures the extent to which collaborative relationships exist within multidisciplinary teams. Furthermore,

although both the EOM and PH-MRI measure degree completion and rewards for enhanced competency, the PH-MRI also measures other aspects of career growth, including pay equity, rewards for longevity, and opportunities for nurses to advance their careers (Dingley & Yoder, 2013; Kramer & Schmalenberg, 2002, 2004a, 2005).

The EOM is used extensively to conduct hospital-based research. The reports of findings are used to pinpoint specific work environment characteristics/problems of interest to hospital management (Kramer et al., 2006; Kramer & Schmalenberg, 2003, 2004a, 2004b, 2005, 2008a, 2008b; Kramer, Schmalenberg, & Maguire, 2010; Schmalenberg & Kramer, 2007, 2008a, 2008b, 2009a, 2009b, 2009c; Schmalenberg et al., 2008). In the future, the PH-MRI could be of great value in conducting similar studies in the public health setting.

Hoppock's Job Satisfaction Scale (HJSS)

The HJSS was developed by Hoppock (1935) to serve as a four-item global measure of job satisfaction. For this PHN study, minor modifications were made to the response set of the original HJSS to enhance clarity. The results of psychometric testing of this modified HJSS remained consistent with those of other studies with respect to the single factor structure, as well as the high degree of validity and reliability found (McNichols et al., 1978; Yoder, 1993, 1995).

Given the validity and reliability of the HJSS, it is surprising that this instrument is not used routinely as a global measure of job satisfaction. Instead, most report the use of single item scales (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Aiken, Clarke, & Sloane, 2002; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Campbell et al., 2004: Kelly et al., 2011; Schmalenberg & Kramer, 2008). Researchers simply may not understand that the HJSS offers two major benefits over single item scales. First, the multi-items structure of

the HJSS allows psychometric testing to be performed. Therefore, validity and reliability can be established (Nunnally & Bernstein, 1993). Second, multi-item scales like the HJSS were shown to have greater predictive ability than single item scales (Diamantopolous, Starstedt, Wilczynski, & Kaiser, 2012).

Magnetic Resource Inventory Organizational Commitment Scale (MRI-OC)

Psychometric testing of the revised 7-item MRI-OC resulted in a valid and reliable survey instrument with two subscales: commitment and concerns. The commitment subscale measured employees' affective (or emotional) attachment to the organization, whereas the concerns subscale measured symptoms of burnout. Other valid and reliable instruments separately measure affective commitment and burnout (Allen & Meyer, 1990; Maslach & Jackson, Porter et al., 1974; Price & Mueller, 1981). However, no other instruments in the healthcare or business literature were found to measure these concepts as linked phenomena.

Public Health Intent to Stay Scale (PH-ITS)

The PH-ITS scale was modeled from two separate instruments. The overall structure was based on the Intent to Stay (ITS) scale developed by Price and Kim (1993). Items in this instrument measured a continuum between intent to leave versus intent to stay with the employer. However, the Price and Kim instrument did not measure leaving intent in terms of one or 5-year time frames as recommended by Ingersoll et al. (2002). Subject matter experts for this PHN study determined that such time frames were important for organizational planning purposes. Therefore, these time frames were incorporated into the PH-ITS. No other instruments were found in the literature of any disciplines that measured intent to stay in this fashion.

RESEARCH QUESTION 2: HOW DO PHNS PERCEIVE CHARACTERISTICS OF THEIR WORK ENVIRONMENTS?

Nurses' perceptions of the public health work environment in Texas were measured by the PH-MRI. Highest mean subscale scores were found with regard to management support, autonomy, teamwork, and service excellence. However, PHNs gave less favorable ratings with regard to career growth opportunities, availability of new employee orientation/training, staffing adequacy, and access to a participatory public health practice model. Each of these findings will be discussed further.

Management Support

For the most part, the nurses who responded to this PHN survey considered their frontline managers to be supportive. Highest marks were given with respect to their managers' leadership qualities, including collaboration, communication, managing change, focusing on priorities, and creating a positive work environment. Positive ratings also were given for most day-to-day management practices, including performance appraisal, and problem correction/conflict resolution. However, a somewhat less than positive rating was given with regard to the level of managerial coaching provided. This is of concern because of the known link between coaching, access to targeted training, and opportunities for career growth (Batson & Yoder, 2009).

National public health experts recognize the importance of management skills to the overall success of public health agencies in achieving their public health mission and goals (IOM, 1988, 2002, 2003b). Moreover, management support has been considered vital to the professional development and optimal use of PHNs (Meagher-Stewart et al., 2010). However, only one of two recent nation-wide public health studies reported findings regarding this matter. In that study, employees reported positive perceptions

regarding the leadership practices of their front-line managers, but no data were collected regarding coaching or other day-to-day management practices (Harper et al., 2015).

Given the stated importance of skilled public health managers, it is surprising that little research has been conducted regarding this issue. It would be especially important for national research to focus on management and leadership practices. Based on findings from the Texas PHN study, it appears that management training to enhance coaching skills also would be advised.

Career Growth

For the most part, nurses in this Texas PHN study reported that opportunities for career growth were lacking within their public health agencies. They gave the lowest marks to their agencies with regard to the following aspects of career growth: external pay equity, opportunities for advancement, support for college, meaningful recognition, and rewards for professional growth. However, unfavorable responses also were given with regard to internal pay equity and rewards for longevity. Concerns regarding the latter aspects of career growth are important because they reflect perceptions regarding organizational justice.

Findings in this Texas study are comparable to those of a recent nation-wide survey of PHNs in the U.S. In that study, more than half of the PHNs in that survey said that they lacked opportunities for advancement beyond their current jobs. Furthermore, most PHNs reported they were dissatisfied with the salaries they received, particularly when compared to the pay offered by outside employers. Of greatest concern was the finding that the PHNs considered pay equity to be an important factor in deciding whether stay in or leave their current jobs (University of Michigan, 2013). In a companion nation-wide survey of public health department employers, more than half of responding agencies reported that a lack

of competitive pay and a lack of promotion opportunities for nurses affected their ability to recruit and retain PHNs (University of Michigan, 2013). Based on these findings, it is evident that public health agencies must do more to support the career growth of their employed PHNs.

Training

Many of the PHNs in this study expressed concerns regarding the lack of new employee orientation and ongoing job-related training provided by their public health agencies. On the other hand, they received greater support for participation in continuing education activities. According to national public health and nursing experts, an in-depth orientation is essential to ensuring that newly employed health professionals are prepared to practice with a minimum level of competency to perform their jobs. Targeted ongoing training and professional continuing education are required to ensure enhanced professional competency over time (Council on Linkages, 2014; IOM, 2003b, 2011). Such training is even more critical for PHNs who do not have a baccalaureate or higher degree in nursing because they enter the workforce without an educational foundation in public health science (ANA, 2013; Quad Council, 2011).

In recent years, many hospitals have developed nurse residency programs. These programs are designed as an academic/practice partnerships to provide an in-depth orientation for newly hired nurses. Such programs were found to be cost-effective because they ensured an entry level of clinical competency, improved patient safety, and reduced nursing staff turnover rates (Goode & Williams, 2004; Pine & Tart, 2007; Spector et al., 2015). It has been recommended that a similar model be developed to orient newly hired PHNs. Training regarding the core competencies of public health would be a major focus of these residency programs (Heiniger & Issel, 2012).

A recent national study indicated that even highly experienced public health professionals lack an entry level of proficiency in many of the nationally established core public health competencies (Castrucci, Leider, & Sellers, 2015; Dixon, McFarlane, Dearth, Grannis, & Gibson, 2015; Kornfeld, Sznol,, & Lee, 2015). This suggests that all public health professionals could benefit from an in-depth orientation/residency program. Furthermore, study findings suggest that a remedial training program is needed for those public health professionals who currently are employed.

Staffing

Staffing issues were found to be a concern for many PHNs in Texas. They believed their workloads were not manageable and they did not receive timely information needed to do their work. Staffing levels were not adequate to meet day-to-day demands or respond to public health disasters/emergencies. Furthermore, the distribution of work was considered to be unfair, with those who worked hardest expected to do more and more. These findings correspond to those from a recent state-wide study of public health departments in Texas. In that study, approximately 30% of the agencies reported vacant RN positions, which took one to three months to fill. Moreover, many agencies reported that they increased the workload of their employed PHNs until new positions could be filled (DSHS, 2013a).

The business research literature shows that timely information is vital to an employee's efficiency and effectiveness at work (Kanter, 1977, 1983, 1993, 2009). Hospital research indicates that prolonged periods of inadequate staffing, heavy workloads, and an unfair distribution of work can contribute to stress, burnout, and spiraling turnover of employees (Leiter, & Maslach, 2009). To enhance efficiency and effectiveness, public health agencies must ensure that needed information is disseminated to staff in a timely

manner. To prevent work stress and further staff turnover, public health agencies should identify creative alternatives to resolving PHN staffing shortages without burdening current staff with added work.

Autonomy

The majority of the PHNs in this Texas survey were able to practice autonomously within their job roles. As a result, they believed they were making a real difference. However, despite reporting a high level of autonomy, many PHNs perceived they were not practicing to their full potential. Furthermore, they reported that new ideas were not always implemented. These findings are not unique to Texas. Organizational support for autonomous practice consistently was reported in the PHN literature (Best & Thurston, 2006; Betkus & MacLeod, 2004; Campbell et al., 2004; University of Michigan, 2013). Moreover, in one recent study in Canada, PHNs ranked autonomy as the most important characteristic of their jobs (Best & Thurston, 2006). On the other hand, national experts agree that many barriers exist to the optimal use of nurses. Recommendations to overcome these barriers included: fostering innovation, supporting higher levels of education and training, involving nurses and other health professionals in workforce and service planning, and enhancing the use of data and information technology in planning efforts (IOM, 2011).

Teamwork

The PHNs in this Texas study generally reported they worked within well-functioning multi-disciplinary teams. Other PHN studies reported similar findings with regard to the level of teamwork experienced (Best & Thurston, 2006; Betkus & MacLeod, 2004; Campbell et al., 2004). Recent nursing research showed that there are a number of advantages of multidisciplinary teamwork in achieving desired outcomes. In the public health setting, such teamwork was found to increase the creativity and effectiveness of

health promotion efforts (Tzenalis, & Sotiriadou, 2010). In the hospital setting, multidisciplinary teams improved patient safety, decreased the length of patient stay, prevented behavioral health problems among the patients, improved work environment quality, reduced adverse patient outcomes, and enhanced learning outcomes of professional staff (Epstein, 2014).

Practice Model

Many of the PHNs in Texas reported they lacked the opportunity to provide input to upper management. Moreover, they had little involvement in the decisions affecting their practice. They were not informed about the "big picture" of what was happening in the organization or how it affected their practice. They were not given the opportunity to serve on agency workgroups/committees, participate in professional organizations, or be engaged in academic/practice partnerships. Other public health studies reported comparable findings regarding PHNs' influence over decision-making and communication with upper management (Campbell et al., 2004; Cole et al., 2010; Harper et al., 2015; University of Michigan, 2013).

Many hospitals employ a shared governance model. This model is based on the premise that increased work productivity and meaningful innovation take place when management and professional staff collaborate to make decisions regarding organizational matters affecting practice. The recommended structure includes an oversight or coordinating council, an evidence-based practice council, an education council, a quality improvement council, and a council for organizational policies and management practices (Porter O'Grady, 1992, 2009; Porter O'Grady & Finnigan, 1984). In Texas, state law also requires that clinical facilities regularly convene a council specifically designed to address adequate staffing (Texas Legislature, 2009). Larger public health agencies may wish to

consider incorporating such a shared governance model. This would ensure that PHNs and members of other public health disciplines have input into staffing and other organizational matters affecting their practice.

Service Excellence

For the most part, the PHNs in this study considered their public health agencies to be mission-driven and quality focused. They described an agency culture based on service excellence and collaboration with community partners. However, many PHNs did not believe that sufficient systems were in place for evaluating and continuously improving the quality of the programs and services provided. Also, many nurses reported their public health agencies did not hire the right mix of qualified people. These findings could not be compared with other studies of the public health work environment because none were found to measure organizational service excellence. However, such research may become more prevalent as public health agency accreditation becomes more widespread and data are collected regarding work environment and service quality (PHAB, 2013; Riley et al., 2012).

RESEARCH QUESTION 3: HOW DO PHNS PERCEIVE THEIR JOB SATISFACTION, ORGANIZATIONAL COMMITMENT, AND INTENT TO STAY?

Job Satisfaction

For the most part, the PHNs who participated in this Texas study reported they liked their jobs and felt satisfied most of the time. These findings are not unique to PHNs in Texas. In another recent survey, job satisfaction was reported by most PHNs nation-wide (University of Michigan, 2013). However, public health agencies should not take the job satisfaction of their PHNs for granted. Hospital research suggests that problems within the work environment ultimately can effect nurses' job satisfaction (Aiken et al., 2002: Blegan,

1993; Hayes et al., 2006: Ingersoll et al., 2002; Price & Mueller, 1986). Furthermore, job satisfaction was found to affect nurses' decisions to leave or stay with their employers (Aiken et al., 2002: Blegan, 1993; Hayes et al., 2006: Price & Mueller, 1986; Tett & Meyer, 1993). Therefore, it is essential for public health agencies to consider all options to ensure job satisfaction by resolving work environment concerns.

Organizational Commitment

Most of the PHNs in Texas reported a strong sense of commitment to their public health agency employers. Although some work stress was experienced, other signs of burnout were not evident. No data were available for comparison with the PHN workforce at large. However, organizational commitment is a well-known phenomenon within the business and healthcare sectors. Prior research suggests that many of the problems identified in this Texas PHN study, such as lack of pay equity, inadequate staffing, and lack of decisional-involvement, have the potential to affect organizational commitment (Cohen, 1991; Cohen & Gattiker, 1994; Ingersoll et al., 2002; Mathieu & Zajac, 1990). If organizational commitment is lacking, staff turnover and other negative behaviors, including low morale and absenteeism may occur (Cohen, 1991; Maslach & Jackson, 1981; Tett & Meyer, 1993). Therefore, it is imperative that public health agencies address concerns regarding the work environment before they have a chance to adversely affect the organizational commitment of PHNs.

Intent to Stay

Most of the PHNs in Texas said they planned to remain with their public health agencies for at least one more year. However, many were thinking about leaving and would not commit to staying five years or more. Therefore, a high rate of PHN turnover should be anticipated in the near future. Public health agencies in Texas appear to be filling many

of their vacant positions with nurses who have extensive experience in another area of nursing. This hiring practice adds to the already disproportionately high number of PHNs who are approaching retirement age. Ultimately, it would seem prudent for public health agencies to develop strategies for attracting and retaining younger nurses. Otherwise, turnover will be a constant problem as the growing number of aging PHNs prepare to retire.

RESEARCH QUESTION 4: HOW DO THE WORK ENVIRONMENT, JOB SATISFACTION, AND ORGANIZATIONAL COMMITMENT PREDICT PHNS' INTENT TO STAY?

In this PHN study, the work environment, job satisfaction, and organizational commitment individually served as predictors of intent to stay. However, a 3-predictor model that included each of the independent variables did a much better job than any single variable in predicting intent to stay. The work environment became statistically non-significant in this 3-predictor model, which suggested that mediated relationships existed (Hayes, 2013; Miles & Shevlin, 2001).

In keeping with the conceptual framework for this study, further analysis was performed to determine whether job satisfaction and/or organizational commitment mediated the causal relationship between the work environment and intent to stay. Job satisfaction was found to serve as a partial mediator, while organizational commitment fully mediated the causal relationship. After these separate pathways were demonstrated, the potential for serial mediation was tested and a satisfaction-to-commitment serial mediation pathway was found. This finding was consistent with the satisfaction-to-commitment serial mediation model proposed by Price & Mueller (1986).

It is unclear why this PHN study was able to confirm the satisfaction-to-commitment pathway proposed by Price and Mueller (1986) when other studies failed to do so (Curry, Wakefield, Price, & Mueller, 1986; Tett & Meyer, 1993). This may be due to similarities in the instruments used for the PHN and Price & Mueller (1986) studies.

However, the facet-based (i.e., work environment process-based) survey instruments often used to measure job satisfaction may have contributed to the problem (Tett & Meyer, 1993).

REVISED CONCEPTUAL MODEL

The Structure-Process-Outcome conceptual framework proved to be useful in examining the relationship between the PHN work environment and outcomes. Changes were made to the middle range theory and conceptual model presented in Chapter One as a result of research findings. Psychometric testing of the PH-MRI resulted in a revised set of subscales/work environment processes, which were labeled as follows: management support, career growth, training, staffing, autonomy, teamwork, practice model, and service excellence. This change was made as the result of one proposed subscale (professional growth) factoring into two separate subscales (training and career growth). The mediation pathways proposed in Chapter One also were changed as a result of research findings. Instead of two separate pathways, one serial satisfaction-to-commitment mediation pathway was found in the causal relationship between the work environment and intent to stay. A revised conceptual model was generated to reflect these changes (See Figure 10 on page 154).

Limitations of the Study

Several limitations were identified for this study. First, despite demographic data that were comparable to those found for PHNs nation-wide, this study did not include participation from PHNs in all public health agencies in Texas. Therefore, the generalizability of findings to the PHN work environment and outcomes of other public health agencies may be reduced.

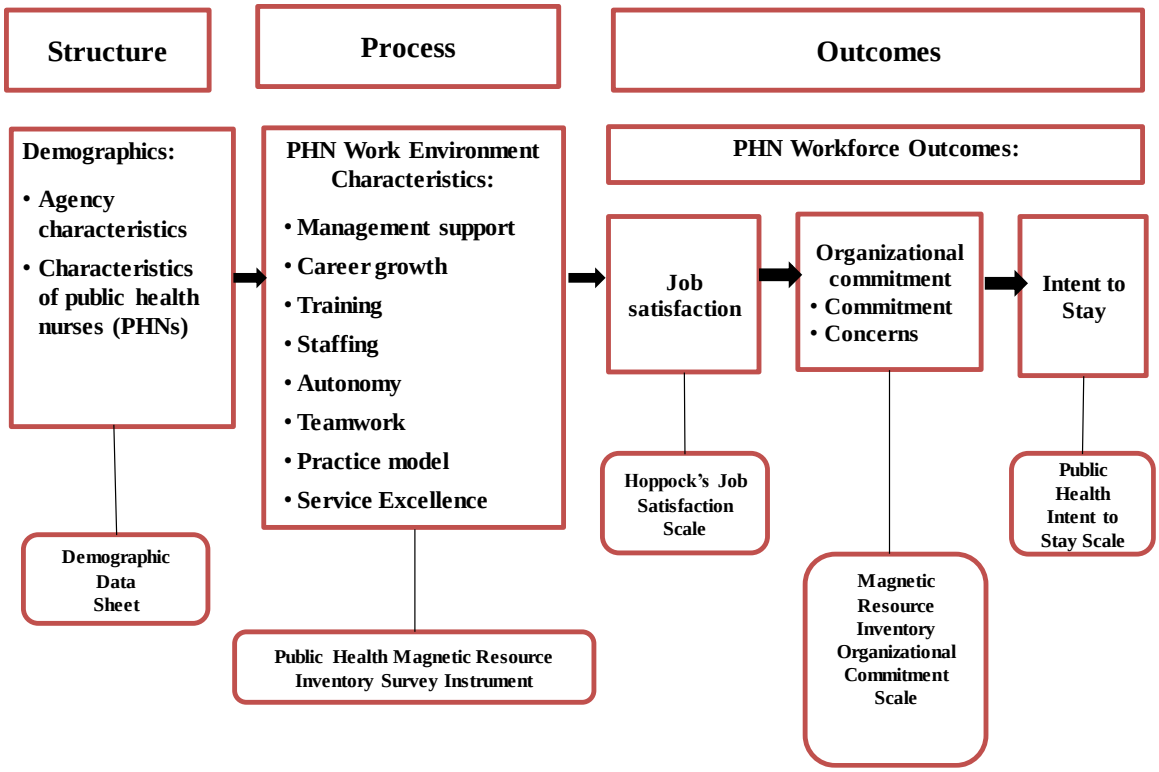

Figure 10: Revised Conceptual Model

The second limitation of this study was the use of a cross-sectional survey design. However, all other recently published public health studies of this nature used a similar research design. Cross-sectional surveys are used because of resource and time limitations. They only measure the phenomena of interest at a single point in time. If time and resources were not an issue for this PHN study, a longitudinal study design would have been preferred. Longitudinal research would have enhanced the understanding of PHNs' perceptions regarding the work environment and critical work environment outcomes, particularly as they change over time.

The final limitation of this study was the lack of stratification of by size of public health agency. Ideally, it would have been useful to stratify by agency size when analyzing

the data because it is possible that PHNs in very small or very large public health departments have different perceptions regarding their work environments. However, PHN recruitment for this study depended on the voluntary participation of public health agencies. The small number of local public agencies that chose to participate in this study prevented data stratification.

Implications and Recommendations

NURSING PRACTICE

A Chief Nursing Officer (CNO) position is recommended for all public health agencies in Texas. It is important to ensure that CNOs have the licensure and educational foundation required to address complex factors affecting the communities they serve. At a minimum, RN licensure and a baccalaureate degree in nursing (BSN) should be required. However, a Master's degree or higher education is preferred. The CNO should hold an executive level position. This would demonstrate the importance of PHN services to the organization's overall mission and goals. A major role of the CNO would be to provide oversight over education, staffing, practice, legal compliance, and policy as it pertains to PHNs.

At the state level, it is recommended that an executive level CNO position be created at the DSHS. A critical role of this CNO would be to convene a state-wide forum with nursing representation from state regional offices, local public health departments, academic institutions, and community partners. This would encourage collaboration across Texas on major issues affecting the public's health. Subcommittees could be established to address issues relating to PHN practice, education, staffing, research, and policy.

Through such a committee structure, the state-wide implications of the findings and recommendations from relevant public health research could be addressed.

Larger public health agencies could benefit from implementing a shared governance practice model. The purpose of implementing such a model would be to delegate a high degree of authority and responsibility for decision making to councils or committees. Academic/practice partnerships would be encouraged in order to enhance evidence-based practice research. Such shared collaboration between upper management and professional staff has been shown to increase innovation and work productivity in the hospital setting. Furthermore, participation in professional organizations should be encouraged. This would enhance professional practice through participation in appropriate continuing education activities and provide an increased awareness of latest trends.

Inadequate PHN staffing was identified as a significant problem affecting PHN practice across Texas. Further turnover should be anticipated as older nurses prepare to retire. To address this problem, it is important for public health agencies to first determine the number and mix of PHNs and other public health professionals required to meet day-to-day service demands and rapidly respond to public health emergencies/disasters. Public health agencies should find creative ways to cover vacant PHN positions until filled without creating excessive workloads for existing staff. If possible, additional funding should be secured to encourage retention by addressing PHNs' concerns regarding internal and external pay equity. In the long run, such retention strategies would be less costly than the staff turnover that otherwise could occur.

Public health agencies should focus on hiring PHNs with a BSN or higher degree. This would ensure an educational foundation in public health science. Recruitment efforts also should focus on hiring a more racially/ethnically diverse workforce that better represents the populations served. Furthermore, public health agencies should work with

schools of nursing to ensure that students have a public health practicum experience. This would enhance the possibility that younger nurses would consider a career in public health.

Public health agencies must ensure that career advancement opportunities are made available to PHNs. One possible option would be to create a specific career path for nurses. This would allow public health agencies to promote PHNs as enhanced experience and competencies are gained. Another option would be to groom PHNs to seek higher level jobs that may or may not fall under a nursing classification. To prepare nurses for such opportunities, additional education and training may be required. Coaching/career development relationships between PHNs and their front-line managers are essential to ensuring that such avenues for advancement are explored. Public health agencies should ensure that mangers are trained as coaches. Periodic evaluation of managers' coaching behaviors also should be required.

EDUCATION AND TRAINING

Inadequate orientation was identified as a significant problem for PHNs in Texas. Therefore, it is recommended that preceptor program be implemented. Academic partners would take responsibility for developing and conducting training activities focused on entry level core public health competencies. Public health departments would be responsible for orienting their employees to the agency's mission, goals, and policies, as well as to the PHN's specific job roles. Further support and coaching would be provided to employees as required. For a preceptor program to be successful, it is essential that sufficient planning and resources be devoted to curriculum development, program implementation, and ongoing evaluation. Such an ambitious project would require state-wide coordination, possibly through the Texas Public Health Association, the Texas Association of City and County Health Officials, and/or DSHS. After the program is in

place and operating successfully, more advanced training could be developed to encourage higher levels of core competencies for public health professionals who wish to advance their careers.

Lack of agency support for enrollment in college courses is a significant problem for many PHNs in Texas. Approximately half of PHNs (or one-third of the RNs) in Texas are not BSN-prepared. Therefore, they do not have an educational foundation in public health science. Furthermore, more than 80% of PHNs do not have a graduate degree. This could represent a major barrier to qualifying for higher level positions. Public health agencies must attempt to find ways to support enrollment in college courses. Ideally, tuition support would be made available. However, other options, such as providing time off for attending classes, also could be of great help to many PHNs.

RESEARCH

Academic/practice partnerships should be enhanced to facilitate public health research. Public health funding increasingly is tied to evidence-based practice and the demonstration of outcomes. However, public health agencies tend to be better at tying interventions to identified needs than to community or system-wide outcomes. Academic partners could be of great help in identifying strategies to address this research gap.

The survey instruments used in this PHN study should be considered for use in future public health work environment research. Item wording is tailored to the public health setting, but is not specific to PHNs. Therefore, these instruments would be appropriate for use in surveying the entire multidisciplinary public health work workforce. Findings from such surveys could be used by public health agencies to make internal quality improvements and develop workforce recruitment and retention plans. Surveys conducted in a longitudinal manner could be used to measure quality improvements over

time. Such surveys may be especially beneficial to public health agencies in the U.S. that are seeking accreditation because work environment assessments are required.

POLICY

In the 84th regular Texas legislative session (2016 – 2017), the DSHS was charged with convening a group of health department, academic, and community partners to evaluate public health capacity and develop a public health infrastructure action plan. However, to-date this work largely has focused on establishing priorities for action, identifying the unique roles of public health system partners, determining potential efficiencies, and eliminating the duplication of services. In a recent report, no mention was made of overall capacity to provide public health services or plans to address gaps in services that may exist across the state. Based on data available regarding PHN workforce capacity in Texas, it is clear that significant gaps exist. Therefore, it is recommended that this critical issue be addressed as progress of the DSHS work group continues toward the development of a state-wide public health infrastructure action plan.

It was difficult to obtain a sample for this survey of the PHN work environment and outcomes in Texas. No central repository for PHN contact information currently exists. Therefore, it is recommended that the Texas Board of Nursing make a minor change to demographic data collected from licensed LVNs, RNs, and APRNs. This would simply involve adding a separate option for public health under the category used to designate primary practice setting. This would create a central repository for contact information and facilitate future efforts to conduct research pertaining to PHN practice in Texas.

Chapter Summary

This was the first PHN study in Texas to investigate the relationships between the work environment, job satisfaction, organizational commitment, and intent to stay. Survey

instruments were found to be highly valid and reliable. Some comparisons could be made between this study and other published studies in the U.S. with regard to PHNs' perceptions of their work environments and job satisfaction. However, no other recent studies reported similar findings regarding PHNs' organizational commitment or intent to stay.

Intent to stay was considered the ultimate outcome of interest for this PHN study because it serves as the best indicator of turnover. A 3-predictor model that included the work environment, job satisfaction, and organizational commitment was found to predict intent to stay. Furthermore, serial satisfaction-to-commitment medication was found in the causal relationship between the work environment and intent to stay. The only other study to report similar findings was conducted in the hospital setting (Price & Mueller). Limitations of this Texas PHN study were discussed. Findings served as the basis for recommendations regarding PHN education, research, and policy.

This study fills an important research gap regarding the PHN work environment and work environment outcomes. Findings will be presented to public health agency leaders and policy makers in Texas. The ultimate goal is to provide information and tools that can be used to improve work environment quality and assist public health agencies in the recruitment and retention of PHNs.

APPENDIX A

Demographic Information Sheet

Please provide the following information about yourself and your organization:

1. Type of governmental public health agency you work for:
    a. Texas Department of State Health Services (DSHS) - Central Office or Region
    b. Local health jurisdiction/department/district in Texas
    c. I do **NOT** work for a state or local public health agency in Texas

Note: If you do **NOT** work for a public health agency in Texas, you do not need to complete this survey. Thank you for your willingness to participate in this survey.

2. What is your agency's public health accreditation status?
    a. Currently accredited by the Public Health Accreditation Board (PHAB)
    b. Seeking PHAB accreditation
    c. Planning to seek PHAB accreditation in the near future
    d. Not currently planning to seek PHAB accreditation
    e. Don't know

3. How would you describe the **PRIMARY SETTING** of the population you serve?
    a. Primarily urban/suburban
    b. Primarily rural
    c. A combination of urban/suburban and rural

4. Does your agency employ a Chief Nursing Officer/Nursing Director?
    a. Yes
    b. No
    c. Don't know

5. Which of the following nursing license(s) do you currently hold? (check all that apply)
    a. Licensed Vocational/Practical Nurse (LVN/LPN)
    b. Registered Nurse (RN)
    c. Advanced Practice Registered Nurse (APRN)
    d. Other (please describe)_____

6. Do you currently hold a professional certification in public health or public health nursing?
    a. Yes
    b. No

7. Which of the following best represents your primary public health job role?
    a. Director/Administrator
    b. Manager/Supervisor
    c. Program Specialist/Consultant
    d. Generalist/Public Health Practice
    e. Clinical Service Provider/Clinic Staff
    f. Other (please describe)_____
    g. Other (please describe)_____
    h. Other (please describe)_____

8. Is a nursing license recommended or required for your job?
    a. Recommended
    b. Required
    c. **NOT** recommended or required

9. Please indicate your current work status:
    a. Full-time (30 hours/week or more)
    b. Part-time (less than 30 hours/week)
    c. Other (please describe) _____

10. Which of the following program/service area(s) do you work in to at least some degree in your current job? (check all that apply):
    a. Administrative (agency-wide)
    b. Behavioral/Mental Health Services (community-based)
    c. Case Management/Care Coordination
    d. Child Health (infants, children, and/or adolescents)
    e. Chronic Disease Prevention/Control
    f. Communicable Disease Control/Epidemiology
    g. Community Organizing/Coalition-building
    h. Emergency/Disaster Preparedness and Response
    i. Environmental Health
    j. Family Planning/Women's Health (excluding maternal health)
    k. Health Education/Health Promotion
    l. Health Inspection/Enforcement
    m. Health Screening/Referral
    n. Health Systems Planning/Policy Development
    o. Immunizations
    p. Maternal Health
    q. Nutrition Services (including Women, Infants, Children [WIC])
    r. Primary Care/Ambulatory Clinic Services
    s. Workforce/Provider Training
    t. Other (please describe) _____

u. Other (please describe) _____
v. Other (please describe) _____

11. Please provide your age in years:_____

12. Please indicate your gender:
    a. Male
    b. Female

13. Please indicate which of the following you would describe as your race(s) (check all that apply):
    a. American Indian/Alaska Native
    b. Asian
    c. Black/African American
    d. Caucasian/White
    e. Native Hawaiian/Pacific Islander
    f. Other (please describe)_____

14. Do you consider yourself to be of Hispanic or Latino ethnicity?
    a. Yes
    b. No

15. Please indicate your highest educational achievement:
    a. Licensed Vocational/Practical Nursing (LVN/LPN)
    b. Diploma - Nursing
    c. Associate degree- Nursing
    d. Associate degree – Other field
    e. Baccalaureate degree – Nursing
    f. Baccalaureate Other field
    g. Master's degree-Nursing
    h. Master's degree – Public Health (MPH)
    i. Master's degree – Other field
    j. Doctorate – Nursing (PhD or DNP)
    k. Doctorate - Public Health (PhD or DrPH)
    l. Doctorate – Other field
    m. Other (please describe) _____

16. How many years of experience do you have in the field of public health? (round to nearest year) _____

17. How many years have you worked for your current public health agency? (round to nearest year) _____

18. How many years have you worked in the job you hold now? (round to nearest year) ____

19. How many years have you worked as a nurse? (round to nearest year) _____

Public Health Work Environment Survey (PH-MRI)

MRI Organizational Commitment Scale (MRI-OC)

These instruments were adapted from survey tools that are copyrighted by the Mississippi Office of Nursing Workforce. Therefore, they can only be made available upon request.

Intent to Stay Scale

For each item below, please check which response you feel best describes your thoughts about continued employment in your public health agency:

	Very Untrue (1)	**Untrue (2)**	**True (3)**	**Very True (4)**
1. I plan to ***continue working*** for this public health agency for at least **ONE MORE YEAR**.				
2. I plan to ***continue working*** for this public health agency for at least the next **FIVE YEARS**				
3. I plan to ***continue working*** for this public health agency **AS LONG AS POSSIBLE**.				
4. I have been thinking about ***leaving*** this public health agency on a **PERMANENT** basis (e.g., to work elsewhere, to change careers, to retire, etc.)				

Hoppock's Job Satisfaction Scale

1. Which **ONE** of the following describes HOW MUCH OF THE TIME you ***feel satisfied*** with your job:
   a. Never
   b. Seldom
   c. Some of the time
   d. About half the time
   e. Most of the time
   f. All of the time.

2. Choose **ONE** of the following statements which best tells ***how well you like your job***:
   a. I hate it.
   b. I dislike it most of the time.
   c. I'm somewhat unhappy with it.
   d. I am indifferent to it.
   e. I'm generally happy with it.
   f. I am enthusiastic about it.
   g. I love it.

3. Which **ONE** of the following best tells how you feel about ***changing your job***:
   a. I would quit this job at once if I could.
   b. I would take almost any other job in which I could earn as much as I am earning now.
   c. I would like to exchange my present job for another one.
   d. I am not eager to change my job, but I would do so if I could get a better job.
   e. I cannot think of any jobs for which I would exchange my current one.
   f. I would not exchange my job for any other.

4. Which **ONE** of the following shows how you think you like your job in ***comparison to other people***:
   a. No one dislikes his/her job more than me.
   b. I dislike my job much more than most people do.
   c. I dislike my job about as much as most people dislike theirs.
   d. I neither like nor dislike my job
   e. I like my job about as well as most people like theirs.
   f. I like my job better than most people do.
   g. No one likes his/her job better than I like mine.

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